United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
the University of Wyoming
Agricultural Experiment
Station, the Forest
Service, and the United
States Department of the
Interior, Bureau of Land
Management

Soil Survey of Albany County Area, Wyoming

How to Use This Soil Survey

General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

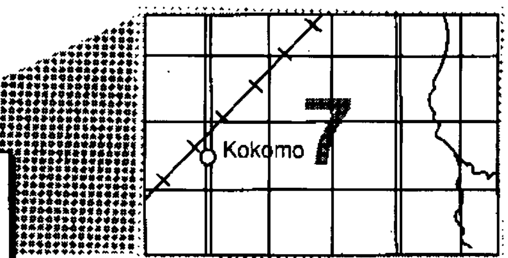
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

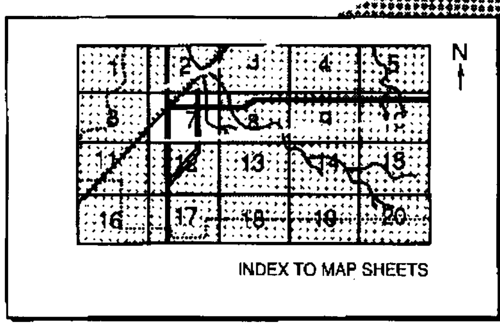
To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map units symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

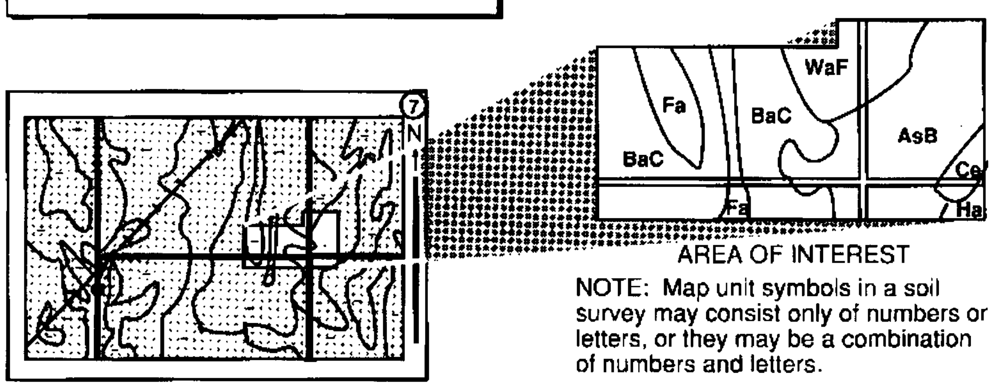
The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.



MAP SHEET



INDEX TO MAP SHEETS



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

MAP SHEET

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1988. Soil names and descriptions were approved in 1991. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1988. This survey was made cooperatively by the Natural Resources Conservation Service, University of Wyoming Agricultural Experiment Station, U.S. Bureau of Land Management, and the U.S. Forest Service. The Albany County Board of Commissioners, the City of Laramie, and the Laramie Rivers Conservation District provided financial assistance for the survey. It is part of the technical assistance furnished to the Laramie Rivers Conservation District. The Albany County Board of Commissioners, the City of Laramie, and the Laramie Rivers Conservation District provided financial assistance for the survey. The survey is part of the technical assistance furnished to the Laramie Rivers Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

All programs and services of the Natural Resources Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: An aerial view of the city of Laramie as viewed from east of the city. Much of the city is on the Wycolo-Tieside-Fiveoh general soil map unit. The mountains in the background are on the general soil map unit of Rogert-Granile-Rock outcrop.

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Issued 1998

Summary

Foreword

This soil survey contains information that can be used in land-planning programs in Albany County, Wyoming. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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State Conservationist
Natural Resources Conservation Service

Soil Survey of
Albany County Area, Wyoming

By Ron Reckner, Natural Resources Conservation Service

Fieldwork by Ron Reckner, Steve Jelden, Joe Moore, Chris Paris, Bob Schloemer, and Paul Sheilds of the Natural Resources Conservation Service; Dr. Larry C. Munn of the University of Wyoming; and Steve Howell, Dick Larsen, and Steve Strenger of the Bureau of Land Management

United States Department of Agriculture, Natural Resources Conservation Service
in cooperation with
the University of Wyoming Agricultural Experiment Station, United States Forest Service, and United States Department of the Interior, Bureau of Land Management

The Albany County Area is comprised of Albany County, excluding the portion of the county within the Laramie Peak and Main Bow Districts of the Medicine Bow National Forest (fig. 1). The area is about 3,593 square miles, or 2,320,491 acres. The survey area includes the 60,000 acre Pole Mountain District of the Medicine Bow National Forest. About 335,000 acres of the survey area, mostly northeast of Rock River, is administered by the Bureau of Land Management.

General Nature of the Survey Area

This section provides general information about the survey area. It describes history, physiography and drainage, geology, and climate.

The 1980 census lists a population of 29,062 for Albany County and 24,410 for the City of Laramie, which is the county seat. The University of Wyoming is in Laramie, and the Union Pacific Railroad maintains large rail yards there. Rock River had 1980 census of 415. The smaller communities in the survey area include Albany, Bosler, Mountain Home, Tie Siding, and Woods Landing.

Most of the survey area is rangeland, and cattle ranches are the dominant agricultural enterprise. About 4.2 percent of the survey area, or 97,000 acres, is irrigated hay and pasture. There are numerous fishing and recreational lakes and streams in the county. Pronghorn antelope, whitetail and mule deer, and elk are fairly common in the area. Fishing, hunting, and tourism are very important to the local economy. Oil production is important in a few areas.

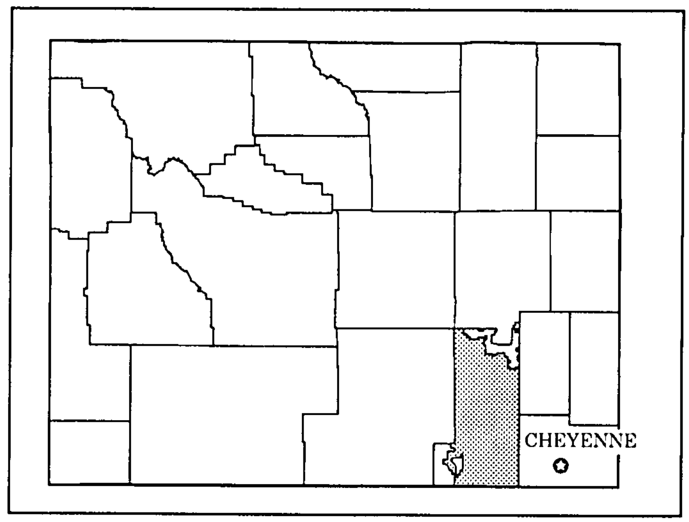

Figure 1.—Location of Albany County Area in Wyoming.

Albany County has two Federal wildlife refuges administered by the Fish and Wildlife Service: Hutton Lake southwest of Laramie, and Bamforth Lake northwest of Laramie.

History

The Overland Trail crosses the south end of the Laramie Plains from southeast to west. It closely follows the route of the older Cherokee Trail used during the migration of the Cherokee tribe to California.

The Arapaho, Cheyenne, and Sioux tribes were nomadic inhabitants of the area before white settlement. The Arapaho are representative of the fate that befell the Plains Indian. Along with the Cheyenne, they were given most of southeast Wyoming and northeast Colorado by the Peace Council of Fort Laramie in 1851. After being harassed in Colorado, the Arapaho were given a different area near Casper, Wyoming by authority of the Medicine Lodge Treaty of 1867. Soon thereafter an unsuccessful attempt was made to move them to northwestern Nebraska. Eventually the Arapaho were forced onto the Wind River Reservation in 1878 (Brink, 1986).

The history of Albany County is also closely related to the Union Pacific Railroad, the University of Wyoming, and to the development of natural resources. In 1865, General Grenville Dodge found the "gangplank" route across the Laramie Range east of the present site of Laramie. The following year this route was selected for the trans-continental railroad. Eventually US Highway 30 and Interstate-80 would closely parallel the route.

Fort Sanders was built near Laramie in 1866 for the troops protecting crews surveying for the railroad. After skirmishes with the Sioux and Cheyenne in May of 1867, troops were temporarily stationed at Rock Creek, Cooper Creek, and Sevenmile Creek. The coming of the actual construction crews triggered further raids in the spring of 1868. Army dignitaries such as Generals Phil Sheridan, Ulysses Grant, and William Sheridan visited the Fort in 1868. The Fort was abandoned in 1882 (Murray, 1974). The city of Laramie was started with the arrival of the railroad. Laramie can claim the world's first jury comprised of women, in March of 1870.

The University of Wyoming opened its doors in 1887, three years before statehood was granted to Wyoming Territory. It is the only four-year institution of higher learning in the state. The seven included colleges, as well as the School of Extended Studies and the Graduate School, occupy some 80 buildings on about 780 acres. The University also has four farms and five agricultural experiment stations, which cover about 5,200 acres in various locations throughout the state (Brink, 1986). A few of the unique attractions of the campus include the Rocky Mountain Herbarium, which has about 300,000 plant specimens, and the S.H. Knight Geology Building museum with its extensive rock, mineral, and fossil collections (Wyoming Recreation Commission, 1976).

Much of the land resources were originally used for summer pasture of horses, particularly for the cavalry. Most of the land was eventually used for cattle grazing. During the first decade of this century, large irrigation projects were started for the production of hay. An example is the Pioneer Canal, which has been operating for about 80 years. Extensive land developments for veterans were attempted after World War I. Many crops met with limited success due to the cool climate and somewhat short growing season.

Energy development and mining are only slightly less prominent in the history of the area. Titanium was mined in the Laramie Range; gold, silver, and copper are examples of minerals developed in the Medicine Bow Range. Herrick Dome and Quealy Dome west of Laramie are examples of currently producing oil fields. The Wyoming Geological Survey has explored the Laramie Range for kimberlite pipes, a source of diamonds.

Physiography and Drainage

Albany County is at the northern end of the southern Rocky Mountains. About one-half of the county is a high, intermontane basin and one-half is mountain ranges. The basin has gently sloping sedimentary beds in its center, and has more steeply sloping beds along the edges and in the foothills. Steeply sloping mountains form the Laramie Range east of Laramie and the Medicine Bow Range west of Laramie.

Elevations in the survey area range from about 5,150 feet where the Laramie River leaves the county, to 9,656 feet on Jelm Mountain. Local relief ranges from tens of feet to several hundred feet in the Laramie Basin, to one or two thousand feet of relief in the mountains. Although many of the geologic formations in the basin are thought to be millions of years old, most of the existing landforms were made by erosion of and deposition on the old rocks during the past several hundred thousand years. Landforms associated with streams may only be several hundred years old.

Streams flowing through the survey area have their headwaters in the previously mentioned mountain ranges and in the Rawah Range of northern Colorado. These streams are tributaries to the Laramie River which flows into Platte County. The major tributaries are the North Laramie River, Rock Creek, Chugwater Creek, Duck Creek, and Crow Creek.

Geology

The earth is currently thought to have formed some 4.5 billion years ago. Very little is known about the geology of Wyoming from this beginning until about 500 million years ago.

Beginning about 500 million years ago and lasting about 200 million years, the state was subject to several

periods of marine invasion by a shallow warm sea. About 300 million years ago, a crustal uplift occurred in many parts of North America, including Colorado and Wyoming. The ancestral Rocky Mountains were formed in Colorado, elevating the southeastern part of Wyoming. This increase in elevation caused accelerated erosion in areas exposed above sea level. The fluctuating shoreline of the warm sea continued to cover portions of Wyoming for another 235 million years, until about 65 million years ago.

Widespread coastal uplift, along with folding and faulting, raised Wyoming entirely above sea level at this time. This episode of mountain building, commonly known as the Laramide Orogeny, lasted about 8 million years. It created large ridges and hills in the marine sediments. With time, these sediments eroded away and exposed the older igneous and metamorphic rocks. Today these rocks form the Medicine Bow and Laramie mountain ranges.

Intense volcanic activity began in Wyoming about 40 million years ago. The volcanoes, located mainly in the Yellowstone area, covered much of the state and surrounding areas with great depths of debris and were active for over 35 million years. It is believed that only the highest mountain tops were not covered.

The interior of the North American continent was uplifted to its present elevation between 3 and 6 million years ago. Due to a different climate caused by the higher elevation and the Ice Age extreme erosion occurred. In a span of some 3 million years, most of the volcanic sediments were eroded away and the marine sedimentary formations were exhumed.

Most of the stable landforms present in the basin today were created during the past tens or hundreds of thousands of years by glacial outwash waters. Sedimentary formations were beveled by water and then covered with relatively thin veneers of cobbly and gravelly alluvium. These deposits are thicker and contain larger coarse fragments in the areas closest to the mountain sources.

Climate

Tables 1a, 1b, and 1c give data on temperature and precipitation for three stations in the survey area. Tables 2a, 2b, and 2c show probable dates of the first freeze in fall and the last freeze in spring. Tables 3a, 3b, and 3c provide data on length of the growing season.

In winter, the average temperature as recorded at the Laramie Airport is 23.5 degrees F and the average daily minimum temperature is 11.6 degrees. The lowest temperature recorded at the station is 50 degrees below zero. In summer, the average temperature is 61 degrees and the average daily maximum temperature is 76.9 degrees. The highest temperature recorded at this station is 95 degrees.

Growing degree days are shown in tables 1a, 1b, and 1c. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation as recorded at the Laramie Airport is 10.85 inches. Of this, 6.46 inches, or 60 percent, usually falls in May through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in May through September is less than 2.9 inches. The average seasonal snowfall is 47.5 inches.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind or segment of the landscape. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Individual soils on the landscape commonly merge into one another as their characteristics gradually change. To construct an accurate map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape

relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on hay yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The general procedures used to make this soil survey are described in the Natural Resources Conservation Service Soil Survey Manual (U.S. Dep. Agric., 1993). Soil mapping was done on quad centered black and white aerial photos at a scale of 1:24,000. These photos were taken during the period of 1976 to 1979, and correspond to U.S. Geological Survey 7.5 minute topographic maps. The photos were viewed stereoscopically to identify changes in bedrock, slope, and other landscape features. False color infrared aerial photos were used to assist with the identification of land features important in the mapping of the soils.

Observations were made and the soils identified at selected locations on various landform positions. The observation points were spaced from 100 to 1,000 feet apart, depending on the complexity of the landforms. Most of the soil samples were taken with truck-mounted hydraulic probes to a depth of four feet, with some samples taken from a depth of five feet. In areas that were not accessible by truck, traverses were done on foot and the soils were observed by the use of a tile spade and hand auger. Frequency of the traverses was largely dependent of the size and complexity of the landforms, but averaged about two or three per section of land in smooth to rolling areas and about one per section of land in steep areas with rough topography. More traverses and more observation points were necessary on irrigated hay fields and pastures because of the more detailed mapping in these areas.

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those on soil maps for adjacent survey areas. Differences are the result of better knowledge of soils, modifications in series concepts, intensity of mapping, or the extent of soils within the survey.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The soils or miscellaneous areas making up one unit can occur in another unit but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils or miscellaneous areas can be identified on the map. Likewise, areas that are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a ranch or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place lope, depth, drainage, and other characteristics that affect management.

The general soil map units in this survey have been grouped for broad interpretive purposes. Each of the broad groups and the map units in each group are described on the following pages.

The General Soil Map of Albany County Area is a part of the State Soil Geographic (STATSGO) data base and general soils map of Wyoming. Map symbols are the same as the STATSGO general soil map units. In each map unit, two or three of the major soils or miscellaneous land types that occur within each map unit are described. More information for the General Soil Map units can be obtained from the STATSGO database available from the Natural Resources Conservation Service.

Map Unit Descriptions

WY131 Boyle-Lininger-Rock Outcrop.

Very shallow to moderately deep, well drained, nearly level to moderately steep soils and Rock outcrop on foothills and mountain slopes.

Slopes are 1 to 25 percent. The average annual precipitation is 15 to 19 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is about 35 percent Boyle and similar soils, 30 percent Lininger and similar soils, and 20 percent Rock outcrop. The remaining 15 percent consists of components of minor extent.

The Boyle and similar soils are on nearly level to moderately steep foothills and mountain slopes. These soils are very shallow or shallow and well drained. They formed in colluvium and residuum derived from granite. The soils have a gravelly coarse textured surface layer and a gravelly to very gravelly moderately fine textured subsoil. Weakly consolidated bedrock is at a depth of 7 to 20 inches.

The Lininger and similar soils are on nearly level to gently sloping foothills and mountain slopes. These soils are moderately deep and well drained. They formed in alluvium and residuum derived from granite. The soils have a medium textured surface layer, a gravelly moderately fine textured upper part of the subsoil, and a very gravelly moderately fine textured lower part of the subsoil. Weakly consolidated bedrock is at depth of 20 to 40 inches.

The Rock outcrop consists of exposures of granite and gneiss.

Of minor extent in this unit are the very deep, moderately well drained Dalecreek soils and the very deep, poorly drained Kovich soils.

This unit is used mainly as rangeland or for wildlife habitat. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils.

Included in this unit are habitat for species such as the white-tailed jackrabbit, thirteen-lined ground squirrel, red squirrel, yellow-bellied marmot, desert cottontail, porcupine, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, coniferous forests, and Rock outcrop. Some areas of this unit are crucial winter habitat for elk, mule deer, and antelope. A few sage grouse breeding areas occur in this unit.

WY132 Rogert-Rock Outcrop.

Shallow, well drained, gently sloping to very steep soils and Rock outcrop on foothills and mountain slopes.

Slopes are 5 to 99 percent. The average annual precipitation is 15 to 19 inches, the average annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

This unit is about 50 percent Rogert and similar soils and 20 percent Rock outcrop. The remaining 30 percent consists of components of minor extent.

The Rogert and similar soils are on gently sloping to very steep foothills and mountain slopes. These soils are shallow and well drained. They formed in colluvium and residuum derived from granite. The soils have a gravelly moderately coarse textured surface layer and a very gravelly moderately coarse textured underlying material. Hard bedrock is at a depth of 10 to 20 inches.

The Rock outcrop consists of exposures of granite.

Of minor extent in this unit on foothills and mountain slopes are the moderately deep Amesmont, Kezar, and Lakehelen soils and the very deep Granile soils. Of minor extent in the valleys of this unit are the very deep, somewhat poorly drained Silas soils and the very deep, poorly drained Vensora soils.

This unit is used mainly as rangeland or for wildlife habitat. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils and by the percentage of Rock outcrop in the unit.

Included in this unit are habitat for species such as the white-tailed jackrabbit, thirteen-lined ground squirrel, red squirrel, yellow-bellied marmot, desert cottontail, porcupine, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, coniferous forests, and Rock outcrop. Some areas of this unit are crucial winter habitat for elk, mule deer, and antelope. A few sage grouse breeding areas occur in this unit.

WY133 Lymanson-Thiel.

Moderately deep or very deep, well drained, gently sloping to moderately steep soils on fan terraces and hills.

Slopes are 5 to 20 percent. The average annual precipitation is 10 to 19 inches, the average annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

This unit is about 45 percent Lymanson and similar soils and 35 percent Thiel and similar soils. The remaining 20 percent consists of components of minor extent.

The Lymanson and similar soils are on gently sloping to moderately steep fan terraces and hills. These soils are moderately deep and well drained. They formed in alluvium and residuum derived from sedimentary rocks. The soils have a medium textured surface layer and a moderately fine textured subsoil. Weakly consolidated bedrock is at a depth of 20 to 40 inches.

The Thiel and similar soils are on gently sloping to moderately steep fan terraces and hills. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a gravelly moderately coarse textured surface layer, a very gravelly moderately fine textured upper part of the subsoil, and a very gravelly moderately coarse textured lower part.

Of minor extent in this unit are the shallow Bucklon soils and the very deep Leavitt soils.

This unit is used mainly as rangeland or for wildlife habitat. This unit has few limitations for use as rangeland. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

Included in this unit are habitat for species such as the white-tailed jackrabbit, thirteen-lined ground squirrel, red squirrel, yellow-bellied marmot, desert cottontail, porcupine, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, coniferous forests, and Rock outcrop. Some areas of this unit are crucial winter habitat for mule deer.

WY134 Rogert-Rock Outcrop-Lakehelen.

Shallow or moderately deep, well drained, gently sloping to very steep soils and Rock outcrop on foothills and mountain slopes.

Slopes are 5 to 99 percent. The average annual precipitation is 15 to 19 inches, the average annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

This unit is about 40 percent Rogert and similar soils, 20 percent Rock outcrop, and 15 percent Lakehelen and similar soils. The remaining 25 percent consists of components of minor extent.

The Rogert and similar soils are on gently sloping to very steep foothills and mountain slopes. These soils are shallow and well drained. They formed in colluvium and residuum derived from granite. The soils have a gravelly moderately coarse textured surface layer and a very gravelly moderately coarse textured underlying material. Hard bedrock is at a depth of 10 to 20 inches.

The Rock outcrop consists of exposures of granite.

The Lakehelen and similar soils are on gently sloping to steep foothills and mountain slopes. These soils are moderately deep and well drained. They formed in colluvium and residuum derived from granite. The soils have a moderately coarse textured surface layer, a very gravelly moderately fine textured subsoil, and a extremely gravelly moderately coarse textured substratum. Hard granite bedrock is at a depth of 20 to 40 inches.

Of minor extent in this unit are the very deep Granile soils and the moderately deep Amesmont soils on

mountain slopes and foothills. Of minor extent in this unit are the very deep, somewhat poorly drained Silas soils and the very deep, poorly drained Vensora soils in the valleys.

This unit is used mainly for recreation or for wildlife habitat. Areas of the Rogert soils are also used as rangeland. A few areas of the Lakehelen soils are used for timber production.

Production of vegetation suitable for livestock grazing on the Rogert soils is limited by droughtiness. Production on the Lakehelen soils is limited by the dense tree canopy cover. Steep slopes limit access by livestock.

Timber harvesting on the Lakehelen soils is limited by steep slopes. Slow regrowth of trees is a limiting factor in the production of merchantable timber.

Included in this unit are habitat for species such as the white-tailed jackrabbit, thirteen-lined ground squirrel, red squirrel, yellow-bellied marmot, desert cottontail, porcupine, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, coniferous forests, and Rock outcrop. Some areas of this unit are crucial winter habitat for elk, mule deer, and antelope.

WY161 Redrob-Grenoble.

Very deep, poorly drained or somewhat poorly drained, nearly level soils on flood plains and low stream terraces.

Slopes are 0 to 3 percent. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is about 55 percent Redrob and similar soils and 25 percent Grenoble and similar soils. The remaining 20 percent consists of components of minor extent.

The Redrob and similar soils are on nearly level flood plains and low stream terraces. These soils are very deep and poorly drained. They formed in alluvium derived from various sources. The soils have a medium textured surface layer. The upper part of the underlying material is moderately fine textured. The lower part is very gravelly and coarse textured. Depth to the very gravelly layer is 23 to 38 inches. Depth to the seasonal high water table is 0 to 24 inches from March through August. Most areas of these soils are subject to a rare hazard of flooding. Some areas, however, are subject to frequent brief flooding from May through June.

The Grenoble and similar soils are on nearly level flood plains and low stream terraces. These soils are very deep and somewhat poorly drained. They formed in alluvium derived from various sources. The soils have a gravelly coarse textured surface layer, and a very gravelly coarse textured underlying material. Depth to the seasonal high water table is 24 to 42 inches from March through August. These soils are subject to frequent brief flooding from May through June.

Of minor extent in this unit are the well drained Bosler soils on higher stream terraces and in areas of riverwash on flood plains adjacent to the stream channel.

This unit is used mainly as rangeland or for wildlife habitat. A few areas are used for hay and pasture.

Production of hay and pasture or of vegetation suitable for livestock grazing is limited by wetness and salinity of the soils. Flooding is a limitation in the areas that are frequently flooded. Droughtiness of the Grenoble soils is also a limitation.

Included in this unit are habitat for species such as the water shrew, muskrat, beaver, raccoon, mink, white-tailed jackrabbit, thirteen-lined ground squirrel, desert and Nuttall's cottontail rabbits, coyote, red fox, and other mammals; and for birds common to pastures, hayland, prairies, and wetland shrubs and trees, as well as those species associated with water areas. Some areas of this unit are crucial winter habitat for mule deer and antelope. Crucial habitat for the Wyoming toad, an endangered species, occurs in the Mortenson Lake area.

WY202 Cheadle-Nathale-Rock Outcrop.

Shallow or moderately deep, well drained, gently sloping to very steep soils and Rock outcrop on ridges, canyon sides, and mountain slopes.

Slopes are 5 to 60 percent. The average annual precipitation is 15 to 19 inches, the average annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

This unit is about 35 percent Cheadle and similar soils, 20 percent Nathale and similar soils, and 20 percent Rock outcrop. The remaining 25 percent consists of components of minor extent.

The Cheadle and similar soils are on gently sloping to steep ridges and canyon sides. These soils are shallow and well drained. They formed in colluvium and residuum derived from sandstone and limestone. The soils have a moderately coarse textured surface layer, a channery moderately coarse textured subsoil, and a very channery moderately coarse textured substratum. Hard bedrock is at a depth of 10 to 20 inches.

The Nathale and similar soils are on strongly sloping to very steep mountain slopes and canyon sides. These soils are moderately deep and well drained. They formed in colluvium and residuum derived from limestone and sandstone. The soils have a gravelly moderately coarse textured surface layer, a very cobbly medium textured upper part of the subsoil, and a very cobbly moderately coarse textured lower part. Hard bedrock is at a depth of 20 to 40 inches.

The Rock outcrop consists of exposures of limestone and sandstone.

Of minor extent in this unit are the moderately deep, clayey Kildor soils and the moderately deep, moderately fine textured Miracle soils.

This unit is used mainly as rangeland or for wildlife habitat. A few areas are used for undeveloped recreation.

Production of vegetation on the Cheadle and Nathale soils suitable for livestock grazing is limited by the droughtiness of the soils. Slope in many areas of this unit limits access by livestock.

Included in this unit are habitat for species such as the white-tailed jackrabbit, thirteen-lined ground squirrel, red squirrel, yellow-bellied marmot, desert cottontail, porcupine, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, coniferous forests, canyon sides, and Rock outcrop. Some areas of this unit are crucial winter habitat for elk, mule deer, and antelope.

WY253 Pilotpeak-Canwall-Rock Outcrop.

Very shallow to moderately deep, well drained, gently sloping to steep soils and Rock outcrop on cuesta dip slopes, structural benches, and canyon sides.

Slopes are 3 to 30 percent. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is about 30 percent Pilotpeak and similar soils, 20 percent Canwall and similar soils, and 20 percent Rock outcrop. The remaining 30 percent consists of components of minor extent.

The Pilotpeak and similar soils are on gently sloping to moderately steep cuesta dip slopes and structural benches. These soils are very shallow or shallow and are well drained. They formed in colluvium and residuum derived from limestone. The soils have a cobbly medium textured or cobbly moderately coarse textured surface layer. The subsoil is very cobbly or extremely cobbly and moderately coarse textured or medium textured. Hard bedrock is at a depth of 7 to 20 inches.

The Canwall and similar soils are on gently sloping to steep cuesta dip slopes and canyon sides. These soils are moderately deep and well drained. They formed in colluvium and eolian deposits derived from limestone and sandstone overlying residuum derived from limestone. The soils have a moderately coarse textured surface layer, a medium textured or moderately coarse textured upper part of the subsoil, and a very cobbly medium textured or very cobbly moderately coarse textured lower part. Hard bedrock is at a depth of 20 to 40 inches.

The Rock outcrop consists of exposures of limestone and sandstone.

Of minor extent in this unit are the very deep Joemre soils on alluvial fans in the valleys and Telecan soils on valley bottoms.

This unit is used mainly as rangeland or for wildlife habitat. A few areas are used for undeveloped recreation.

Production of vegetation suitable for livestock grazing on the Pilotpeak and Canwall soils is limited by the droughtiness of the soils and the low annual precipitation.

Included in this unit are habitat for species such as the white-tailed jackrabbit, thirteen-lined ground squirrel, red squirrel, yellow-bellied marmot, desert cottontail, porcupine, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, coniferous forests, canyon sides, and Rock outcrop. Some areas of this unit are crucial winter habitat for elk and mule deer.

WY254 Borollic Camborthids-Pahlow-Alcova.

Very deep, well drained, nearly level to strongly sloping soils on alluvial fans and terraces.

Slopes are 0 to 10 percent. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is about 30 percent Borollic Camborthids and similar soils, 25 percent Pahlow and similar soils, and 20 percent Alcova and similar soils. The remaining 25 percent consists of components of minor extent.

The Borollic Camborthids and similar soils are on nearly level to gently sloping alluvial fans and terraces with a mounded microrelief. These soils are very deep and well drained. They formed in alluvium derived from various sources and modified by cryoturbation. The soils have a very gravelly moderately coarse textured surface layer. The subsoil is gravelly or very gravelly and moderately coarse textured or medium textured.

The Pahlow and similar soils are on nearly level terraces with a mounded microrelief. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a gravelly moderately coarse textured surface layer, a very gravelly moderately coarse textured upper part of the subsoil, and a very gravelly or extremely gravelly coarse textured lower part.

The Alcova and similar soils are on nearly level to strongly sloping alluvial fans and terraces. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a moderately coarse textured surface layer and a moderately fine textured upper part of the subsoil. The lower part of the subsoil is very gravelly and moderately fine textured, medium textured, or moderately coarse textured.

Of minor extent in this unit are the somewhat poorly drained Folavar soils on stream terraces and the shallow

Blazon and moderately deep Delphill soils on hillslopes. Also of minor extent are the saline, nongravelly Tisworth soils and the nongravelly Forelle and Rock River soils.

This unit is used mainly as rangeland or for wildlife habitat. A few areas are used for hay and pasture.

This unit has few limitations for use as rangeland. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation. (See figure 2.)

If this unit is used for hay and pasture, the main limitation is the droughtiness of the soils. The complex slopes in the areas of the mounded microrelief require special irrigation methods to properly apply irrigation water.

Included in this unit are habitat for species such as the desert cottontail rabbit, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, pastures, hayland, and prairies. Some areas of this unit are crucial winter habitat for antelope. A few sage grouse breeding areas occur in this unit.

WY255 Forelle-Poposhia-Diamondville.

Moderately deep or very deep, well drained, nearly level to moderately steep soils on terraces, fan aprons, hills, and ridges.

Slopes are 0 to 30 percent. The average annual precipitation is 10 to 14 inches, the average annual air

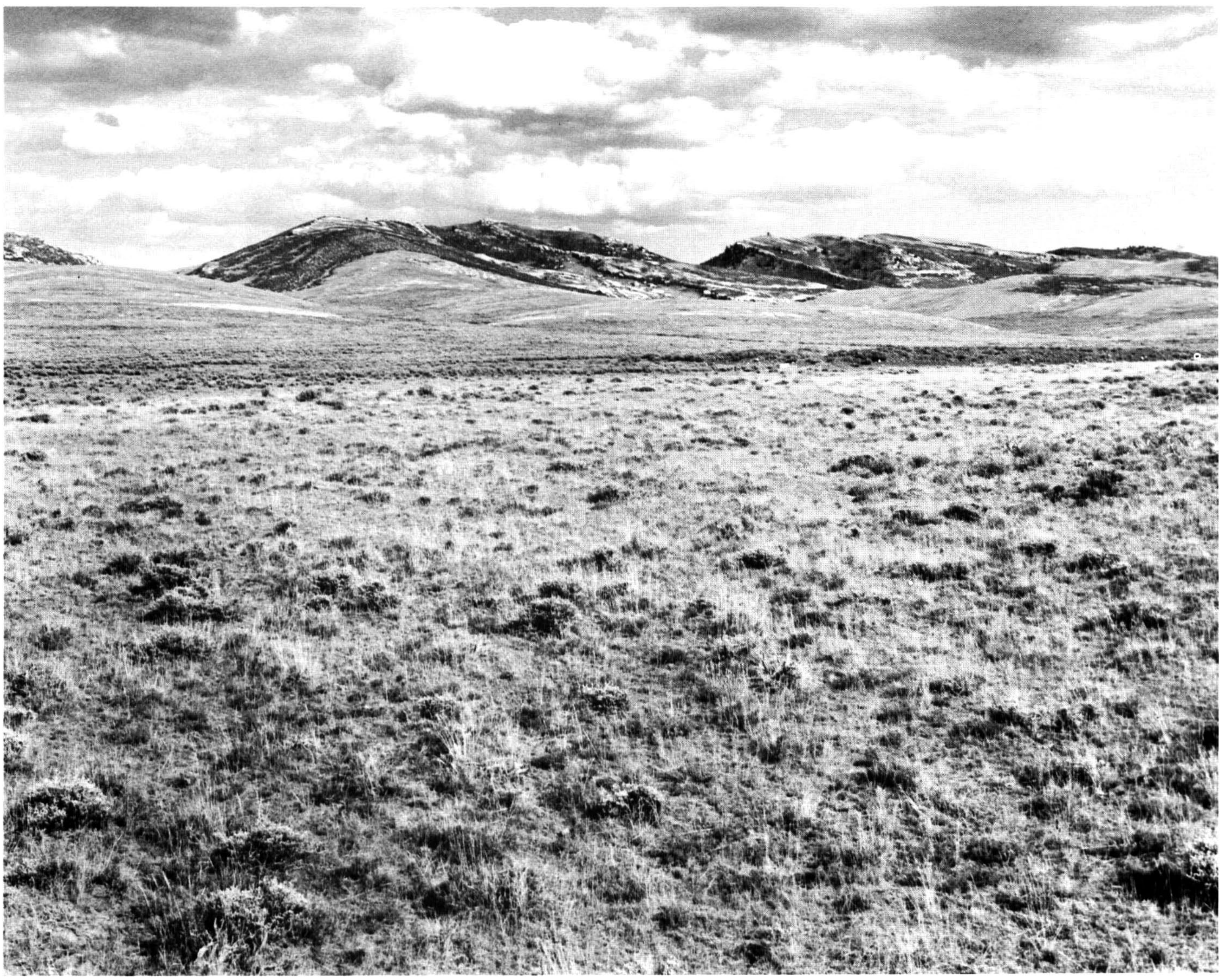

Figure 2.—Area near Wallrock Canyon. In the foreground is the Borollic Camborthids-Pahlow-Alcova general soil map unit. In the background is the general soil map unit of Pilotpeak-Canwall-Rock outcrop.

temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is about 30 percent Forelle and similar soils, 20 percent Poposhia and similar soils, and 15 percent Diamondville and similar soils. The remaining 35 percent consists of components of minor extent.

The Forelle and similar soils are on nearly level to gently sloping terraces, fan aprons, and hills. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a moderately coarse textured surface layer and a medium textured to moderately fine textured subsoil.

The Poposhia and similar soils are on gently sloping to moderately steep hills, ridges, and fan aprons. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a medium textured surface layer and subsoil.

The Diamondville and similar soils are on nearly level to strongly sloping ridges and hills. These soils are moderately deep and well drained. They formed in alluvium derived from sandstone and shale. The soils have a moderately coarse textured surface layer, a medium textured upper part of the subsoil, and a moderately coarse textured lower part. Weakly consolidated bedrock is at a depth of 20 to 40 inches.

Of minor extent in this unit are the shallow Blazon soils on hillslopes; as well as the Bosler and Alcova soils, which have a very gravelly substratum, on terraces and alluvial fans.

This unit is used mainly as rangeland or for wildlife habitat. It has few limitations for use as rangeland. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

Included in this unit are habitat for species such as the desert cottontail rabbit, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes and prairies. Some areas of this unit are crucial winter habitat for mule deer and antelope. A few sage grouse breeding areas occur in this unit.

WY256 Gerdrum Family-Tisworth-Elkol.

Very deep, well drained, nearly level to gently sloping soils on fan terraces, stream terraces, and hillslopes.

Slopes are 0 to 8 percent. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period 85 to 110 days.

This unit is about 25 percent Gerdrum Family and similar soils, 25 percent Tisworth and similar soils, and 20 percent Elkol and similar soils. The remaining 30 percent consists of components of minor extent.

The Gerdrum Family and similar soils are on nearly level to gently sloping stream terraces, fan terraces, and hillslopes. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a medium textured surface layer, a moderately fine textured upper part of the subsoil, and a fine textured lower part. The upper part of the subsoil is strongly alkaline. The lower part of the subsoil is moderately saline.

The Tisworth and similar soils are on nearly level to gently sloping stream terraces and fan terraces. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a moderately coarse to moderately fine textured surface layer and a moderately fine textured subsoil. The subsoil is strongly to very strongly alkaline and moderately saline.

The Elkol and similar soils are on nearly level to gently sloping stream terraces and hillslopes adjacent to playas. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a moderately fine textured surface layer and subsoil. These soils are strongly alkaline and slightly saline.

Of minor extent in this unit are the nonsaline, shallow Blazon and Moyerson soils and the nonsaline, moderately deep Chaperton and Delphill soils. Also of minor extent are the very deep, nonsaline Forelle and Bosler soils.

This unit is used mainly as rangeland or for wildlife habitat. Production of vegetation suitable for livestock grazing is limited by the salinity and alkalinity of the soils and by the low annual precipitation.

Included in this unit are habitat for species such as the desert cottontail rabbit, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes and prairies. Some areas of this unit are crucial winter habitat for antelope. A few sage grouse breeding areas occur in this unit.

WY258 Wycolo-Tieside-Fiveoh.

Shallow, moderately deep, or very deep, well drained, nearly level to moderately steep soils on cuestas, hills, structural benches, alluvial fans, and terraces.

Slopes are 1 to 20 percent. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is about 30 percent Wycolo and similar soils, 25 percent Tieside and similar soils, and 20 percent Fiveoh and similar soils. The remaining 25 percent consists of components of minor extent.

The Wycolo and similar soils are on nearly level to moderately steep cuestas, hills, structural benches, and terraces. These soils are moderately deep and well drained. They formed in residuum derived from interbedded sandstone and shale. The soils have a moderately coarse textured surface layer and a moderately fine textured to medium textured subsoil.

Weakly consolidated bedrock is at a depth of 20 to 40 inches. (See figure 3.)

The Tieside and similar soils are on gently sloping to strongly sloping cuesta dip slopes, hillslopes, structural benches, and strath terraces. These soils are shallow and well drained. They formed in residuum derived from interbedded sandstone, limestone, and shale. The soils have a moderately coarse textured surface layer and subsoil. Weakly consolidated bedrock is at a depth of 10 to 20 inches.

The Fiveoh and similar soils are on nearly level to gently sloping alluvial fans and terraces. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a moderately coarse textured surface layer and subsoil. In some areas, the lower part of the subsoil is very cobbly.

Of minor extent in this unit are the very deep Almy and Joemre soils and the very deep, moderately well drained Alogia soils.

This unit is used mainly as rangeland or for wildlife habitat. Small areas near Laramie are used for homesites and other urban developments. (See cover photo.)

This unit has few limitations for use as rangeland. Production of vegetation suitable for livestock grazing is moderately limited by the droughtiness of the Tieside soils and by the low annual precipitation.

If this unit is used for homesites and urban developments, the main limitations are the depth to

Figure 3.—An area of the Wycolo-Tieside-Fiveoh general soil map unit near Marshall road north of Rock Creek. The Wycolo and Tieside soils are on the hills and cuestas in the foreground. On the terrace in the upper right corner is the Fiveoh soil.

bedrock in the Tieside and Wycolo soils and the slope in areas where it is more than 8 percent.

Included in this unit are habitat for species such as the desert cottontail rabbit, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes and prairies. Some areas of this unit are crucial winter habitat for mule deer and antelope. A few sage grouse breeding areas occur in this unit.

WY314 Bateson-Forelle.

Very deep, well drained, nearly level to strongly sloping soils on terraces, hills, fan aprons, and breaks of dissected pediments.

Slopes are 0 to 15 percent. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is about 40 percent Bateson and similar soils and 40 percent Forelle and similar soils. The remaining 20 percent consists of components of minor extent.

The Bateson and similar soils are on strongly sloping breaks of dissected pediments. These soils are very deep and well drained. They formed in alluvium derived from various sources overlying residuum derived from tuffaceous conglomerate. The soils have a gravelly moderately fine textured surface layer and upper part of the subsoil and a very gravelly coarse textured lower part.

The Forelle and similar soils are on nearly level to gently sloping terraces, fan aprons, and hills. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a moderately coarse textured surface layer, a moderately fine textured upper part of the subsoil, and a medium textured lower part.

Of minor extent in this unit are the shallow Rentsac soils and the moderately deep Diamondville soils.

This unit is used mainly as rangeland or for wildlife habitat. It has few limitations for use as rangeland. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

Included in this unit are habitat for species such as the desert cottontail rabbit, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes and prairies. Some areas of this unit are crucial winter habitat for mule deer.

WY357 Miracle-Cheadle-Rock Outcrop.

Shallow to moderately deep, well drained, gently sloping to steep soils and Rock outcrop on mountain slopes, ridges, cuestas, and canyon sides.

Slopes are 5 to 45 percent. The average annual precipitation is 15 to 19 inches, the average annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

This unit is about 40 percent Miracle and similar soils, 30 percent Cheadle and similar soils, and 15 percent Rock outcrop. The remaining 15 percent consists of components of minor extent.

The Miracle and similar soils are on gently sloping to steep mountain slopes, ridges, cuestas, and canyon sides. These soils are moderately deep and well drained. They formed in alluvium, colluvium, and residuum derived from sandstone, limestone, and shale. The soils have a moderately coarse textured surface layer, a moderately fine textured upper part of the subsoil, and a moderately coarse textured lower part. Hard sandstone bedrock is at a depth of 20 to 40 inches.

The Cheadle and similar soils are on gently sloping to steep ridges, cuesta escarpments, and canyon sides. These soils are shallow and well drained. They formed in residuum and colluvium derived from sandstone and limestone. The soils have a moderately coarse textured surface layer, a channery moderately coarse textured subsoil, and a very channery moderately coarse textured substratum. Hard sandstone bedrock is at a depth of 10 to 20 inches.

Of minor extent in this unit are very deep moderately fine textured soils and moderately deep, very cobbly, moderately coarse textured soils.

This unit is used mainly as rangeland or for wildlife habitat. A few areas are used for undeveloped recreation.

Steepness of slope limits access by livestock to many areas of this unit. The Miracle soils are well suited to the production of vegetation suitable for livestock grazing. Production on the Cheadle soils is limited by the droughtiness of the soils.

Included in this unit are habitat for species such as the white-tailed jackrabbit, thirteen-lined ground squirrel, red squirrel, yellow-bellied marmot, desert cottontail, porcupine, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, coniferous forests, canyon sides, and Rock outcrop. Some areas of this unit are crucial winter habitat for mule deer.

WY374 Poposhia-Blazon-Ipson

Very shallow, shallow, or very deep and well drained soils on nearly level to steep alluvial fans, fan aprons, hills, fan terraces, escarpments, and ridges.

Slopes are 1 to 45 percent. The average annual precipitation is 10 to 17 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is less than 85 to 110 days.

This map unit is about 30 percent Poposhia and similar soils, 25 percent Blazon and similar soils, and 15 percent

Ipson and similar soils. The remaining 30 percent consists of soils of minor extent.

Poposhia soils are on nearly level to steep fan aprons and hills. These soils are very deep and well drained. They formed in alluvium. They are medium textured throughout the profile.

Blazon soils are on nearly level to steep ridges, fan terraces, escarpments, and hills. These soils are very shallow or shallow and are well drained. They formed in colluvium and residuum derived from loamstone. They are moderately fine textured throughout the profile. Depth to bedrock ranges from 8 to 20 inches.

Ipson soils are on gently sloping to steep alluvial fans and fan terraces. These soils are very deep and well drained. They formed in gravelly alluvium. They have a gravelly and moderately coarse textured surface layer. The upper part of the subsoil is very gravelly and moderately fine textured. The lower part is very gravelly and moderately coarse textured.

Of minor extent in this unit are the moderately deep medium textured Chaperton soils on hills; the very deep moderately fine textured Evanston soils on hills and alluvial fans; and Rock outcrop on hills, escarpments, and ridges.

This unit is used for rangeland and as wildlife habitat.

This unit is moderately suited for livestock grazing. Steepness of slope in many areas limits access by livestock. Production of vegetation suitable for livestock grazing on areas of the Blazon soil is limited by the droughtiness of the soil.

Included in this unit are habitat for species such as the desert cottontail rabbit, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, coniferous forests, canyon sides, and Rock outcrop. Some areas of this unit are crucial winter habitat for elk, mule deer, and antelope.

WY379 Browtine-Lymanson-Dahlquist.

Moderately deep or very deep, well drained, nearly level to moderately steep soils on hills and fan terraces.

Slopes are 0 to 45 percent. The average annual precipitation is 10 to 19 inches, the average annual air temperature is 38 to 45 degrees F, and the average frost-free period is less than 60 to 110 days.

This unit is about 30 percent Browtine and similar soils, 25 percent Lymanson and similar soils, and 20 percent Dahlquist and similar soils. The remaining 25 percent consists of components of minor extent.

The Browtine and similar soils are on nearly level to steep fan terraces and hillslopes. These soils are very deep and well drained. They formed in alluvium and outwash derived from various sources. The soils have a very gravelly moderately coarse textured surface layer and subsoil. The substratum is extremely gravelly and moderately coarse textured.

The Lymanson and similar soils are on gently sloping to moderately steep hills and fan terraces. These soils are moderately deep and well drained. They formed in alluvium and residuum derived from sedimentary rocks. The soils have medium textured surface layer and a moderately fine textured subsoil. Weakly consolidated bedrock is at a depth of 20 to 40 inches.

The Dahlquist and similar soils are on nearly level to gently sloping fan terraces. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a very gravelly moderately coarse textured surface layer. The upper part of the subsoil is very gravelly or very cobbly and moderately fine textured. The lower part of the subsoil is very gravelly and moderately coarse textured.

Of minor extent in this unit are the very deep, moderately fine textured Leavitt and Rock River soils; the very deep, moderately coarse textured Rawlins soils; and the shallow Blackhall soils.

This unit is used mainly as rangeland or for wildlife habitat. This unit has few limitations for use as rangeland. Production of vegetation suitable for livestock grazing is moderately limited by the droughtiness of the soils.

Included in this unit are habitat for species such as the desert cottontail rabbit, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes and prairies. Some areas of this unit are crucial winter habitat for elk, mule deer, and antelope.

WY380 Cutback-Shirleybasin-Twocabin.

Moderately deep or very deep, well drained, nearly level to moderately steep soils on pediments, ridges, and breaks.

Slopes are 0 to 25 percent. The average annual precipitation is 10 to 14 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is about 35 percent Cutback and similar soils, 30 percent Shirleybasin and similar soils, and 15 percent Twocabin and similar soils. The remaining 20 percent consists of components of minor extent.

The Cutback and similar soils are on nearly level to moderately steep pediments. These soils are moderately deep and well drained. They formed in alluvium and residuum derived from conglomerate and tuff. The soils have a moderately coarse textured surface layer and a moderately fine textured upper part of the subsoil. The lower part of the subsoil is very gravelly and moderately coarse textured. Weakly consolidated bedrock is at a depth of 20 to 40 inches.

The Shirleybasin and similar soils are on nearly level to gently sloping pediment summits and foot slopes of

pediment breaks. These soils are very deep and well drained. They formed in alluvium and residuum derived from tuffaceous sedimentary rocks. The soils have a medium textured surface layer, a moderately fine textured and fine textured upper part of the subsoil, and a gravelly moderately fine textured lower part.

The Twocabin and similar soils are on gently sloping to strongly sloping crests of ridges, breaks, and knobs on dissected pediments. These soils are very deep and well drained. They formed in alluvium derived from various sources. The soils have a gravelly medium textured surface layer and a very gravelly medium to moderately fine textured upper part of the subsoil. The lower part of the subsoil is medium textured.

Of minor extent in this unit are the shallow Tule and Chalkville soils.

This unit is used mainly as rangeland or for wildlife habitat. This unit has few limitations for use as rangeland. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the droughtiness of the Twocabin soil.

Included in this unit are habitat for species such as the desert cottontail rabbit, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes

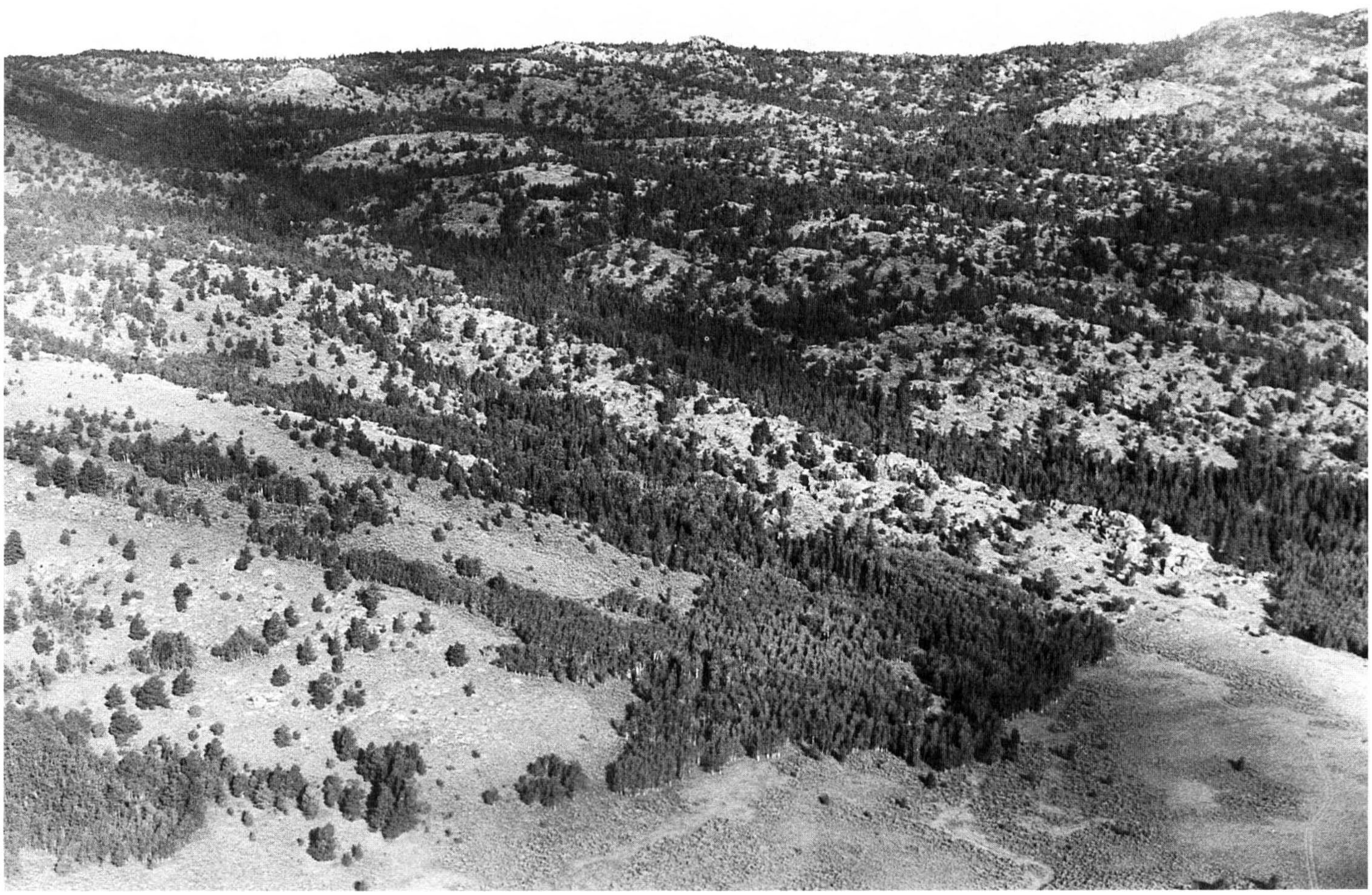

Figure 4.—An area of the Rock outcrop-Cathedral-Alderon general soil map unit in the Laramie Range near Toltec. The remaining 30 percent consists of components of minor extent.

and prairies. A few sage grouse breeding areas occur in this unit.

WY381 Rock Outcrop-Cathedral-Alderon.

Rock outcrop and shallow and moderately deep, well drained, gently sloping to very steep soils on foothills and mountains.

Slopes are 5 to 50 percent. The average annual precipitation is 15 to 19 inches, the average annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is about 30 percent Rock outcrop, 25 percent Cathedral and similar soils, and 15 percent Alderon and similar soils. (See figure 4.)

The Rock outcrop consists of exposures of granite.

The Cathedral and similar soils are on gently sloping to steep foothills and mountains. These soils are shallow and well drained. They formed in colluvium and residuum derived from granite. The soils have a very stony moderately coarse textured surface layer and a very gravelly moderately coarse textured underlying material. Hard bedrock is at a depth of 10 to 20 inches.

The Alderon and similar soils are on gently sloping to very steep foothills and mountain slopes. These soils are moderately deep and well drained. They formed in colluvium and residuum derived from granite. The soils have a moderately coarse textured surface layer, a gravelly moderately fine textured subsoil, and a very gravelly moderately coarse textured substratum. Weakly consolidated bedrock is at a depth of 20 to 40 inches.

Of minor extent in this unit are the very deep, moderately well drained Dalecreek soils in the valleys and the very deep Granile soils in areas of lodgepole pine on the foothills and mountain slopes.

This unit is used mainly as rangeland or for wildlife habitat. A few areas are used for timber production or for undeveloped recreation.

Production of vegetation suitable for livestock grazing is limited by the amount of Rock outcrop in the unit, the droughtiness of the Cathedral soils, and the tree canopy cover on the Alderon soil. In many areas, slope limits access by livestock.

If the Alderson soils are used for timber production, the main limitations are slope and the slow regrowth of the trees.

Included in this unit are habitat for species such as the white-tailed jackrabbit, thirteen-lined ground squirrel, red squirrel, yellow-bellied marmot, desert cottontail, porcupine, coyote, red fox, badger, and other mammals; and for birds common to shrub steppes, coniferous forests, and Rock outcrop. Several areas in this unit are crucial winter habitat for elk, mule deer, and bighorn sheep.

Detailed Soil Map Units

The map units delineated on the detailed maps at the back of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the heading "Use and Management of the Soils."

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, in slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Rock River sandy loam is a phase of the Rock River series.

Most of the map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or associations.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Bonjea-Chugcreek-Rock outcrop, 3 to 15 percent slopes is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey

area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Rainbolt-Morset association, 3 to 25 percent slopes is an example.

This survey includes *miscellaneous areas.* Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Map Unit Descriptions

100—Aberone gravelly sandy loam, 0 to 15 percent slopes.

This very deep, well drained soil is on dissected fan terraces. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 5,500 to 6,000 feet. The annual precipitation is 12 to 14 inches, the annual air temperature is 45 to 49 degrees F, and the average frost-free period is 85 to 110 days.

Included in this unit are small areas of Chaperton loam and Poposhia loam. Also included are areas of shallow soils on steeper slopes of dissected fan terraces. Included areas make up about 15 percent of the total acreage.

Typically 15 percent of the surface is covered with gravel. The surface layer is brown gravelly sandy loam 8 inches thick. The upper part of the subsoil is pinkish gray very gravelly sandy loam 7 inches thick. The lower part is very pale brown extremely gravelly coarse sandy loam to a depth of 60 inches or more.

Permeability of the Aberone soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 60 inches or more for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate in the lower part of the subsoil restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Aberone soil is mainly prairie sandreed, needleandthread, threadleaf sedge, blue grama, and sand bluestem. As the range condition deteriorates, threadleaf sedge and fringed sagewort increase. As the range condition further deteriorates, broom snakeweed, milkweed, and annual grasses invade. The potential plant community produces about 1,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,300 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the droughtiness of the soil.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately well suited for mechanical range renovation and for range seeding. The main limitations are the gravelly surface layer and the hazard of wind erosion. The low annual precipitation should be of concern when planning range seedings. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass IVe, nonirrigated. It is in the Shallow Sandy, 12- to 14-inch precipitation, Southern Plains range site.

101—Abston-Bullock complex, 5 to 25 percent slopes.

This map unit is on hillslopes and terrace escarpments. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,000 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Abston loam and 40 percent Bullock sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Gerdrum Family loam, Blazon clay loam, Diamondville fine sandy loam, and Tisworth sandy loam. Included areas make up about 20 percent of the total acreage.

The Abston soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from shale. Typically the surface layer is dark yellowish brown loam 2 inches thick. The upper 3 inches of the subsoil are strongly alkaline, dark yellowish brown clay loam. The next 13 inches are very strongly alkaline, yellowish brown clay loam. The lower part is very strongly alkaline yellowish brown silty clay loam 7 inches thick. Weakly consolidated sodic shale is at a depth of 25 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Abston soil is very slow. Available water capacity is low. Effective rooting depth is 20 to 40

inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Bullock soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from shale interbedded with sandstone. Typically the surface is 25 percent covered with gravel. The surface layer is brown sandy loam 2 inches thick. The upper part of the subsoil is strongly alkaline, yellowish brown clay loam 6 inches thick. The next 8 inches are very strongly alkaline, yellowish brown clay loam. The lower part is very strongly alkaline, light gray loam 8 inches thick. Weakly consolidated sandstone interbedded with shale is at a depth of 24 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Bullock soil is moderately slow. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Abston soil is mainly birdfoot sagebrush, western wheatgrass, bottlebrush squirreltail, gardner saltbush, and Indian ricegrass. As the range condition deteriorates, birdfoot sagebrush increases. As the range condition further deteriorates, annual grasses and weeds invade. The potential plant community produces about 500 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years.

The potential plant community on the Bullock soil is mainly western wheatgrass, bluebunch wheatgrass, needleandthread, gardner saltbush, birdfoot sagebrush, and big sagebrush. As the range condition deteriorates, bottlebrush squirreltail, blue grama, birdfoot sagebrush, and gardner saltbush increase. As the range condition further deteriorates, foxtail barley and annual grasses and weeds invade. The potential plant community produces about 700 pounds of air-dry vegetation per acre in normal years. Production ranges from 900 pounds in favorable years to 500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

Production of vegetation suitable for livestock grazing is limited by the alkalinity of the soils. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing should be managed to protect the unit from excessive erosion.

This unit is poorly suited for stockwater ponds, mechanical range renovation, or range seeding. The main limitations for stockwater ponds are the slope and the depth to bedrock. The main limitations for range seeding or mechanical range renovation are the alkalinity of the soils, steepness of the slope, and the hazard of water erosion.

This unit is in capability subclass VIe, nonirrigated. The Abston soil is in the Impervious Clay, 10- to 14-inch High Plains Southeast range site; and the Bullock soil is in the Saline Loamy, 10- to 14-inch High Plains Southeast range site.

102—Alcova-Borollic Camborthids complex, 0 to 8 percent slopes.

This map unit is on alluvial fans and terraces with a mound-intermound pattern of micro-relief. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Alcova sandy loam and 35 percent Borollic Camborthids soil. The Alcova soil is on the toe slopes of the mounds and in the intermound areas. The Borollic Camborthids soil is on the mounds. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Bosler fine sandy loam, Forelle loam, Lupinto gravelly loam, and Tisworth fine sandy loam. Included areas make up about 20 percent of the total acreage.

The Alcova soil is very deep and well drained. It formed in alluvium. (See figure 5.)

Typically the surface layer is pale brown sandy loam 3 inches thick. The upper part of the subsoil is yellowish brown sandy clay loam 12 inches thick. The next 22 inches are very pale brown sandy clay loam. The lower part to a depth of 60 inches are pale brown very gravelly sandy clay loam.

Permeability of the Alcova soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Borollic Camborthids soil is very deep and well drained. It formed in alluvium derived from various sources modified by congeliturbation. These soils vary from area to area, and no single profile is typical. Commonly, the surface is 30 percent covered with fine gravel. The surface layer is commonly yellowish brown gravely sandy loam or very gravelly sandy loam 3 inches thick. The upper part of the subsoil is commonly yellowish brown gravelly sandy loam or very gravelly sandy clay loam 7 inches thick. The lower part to a depth of 60

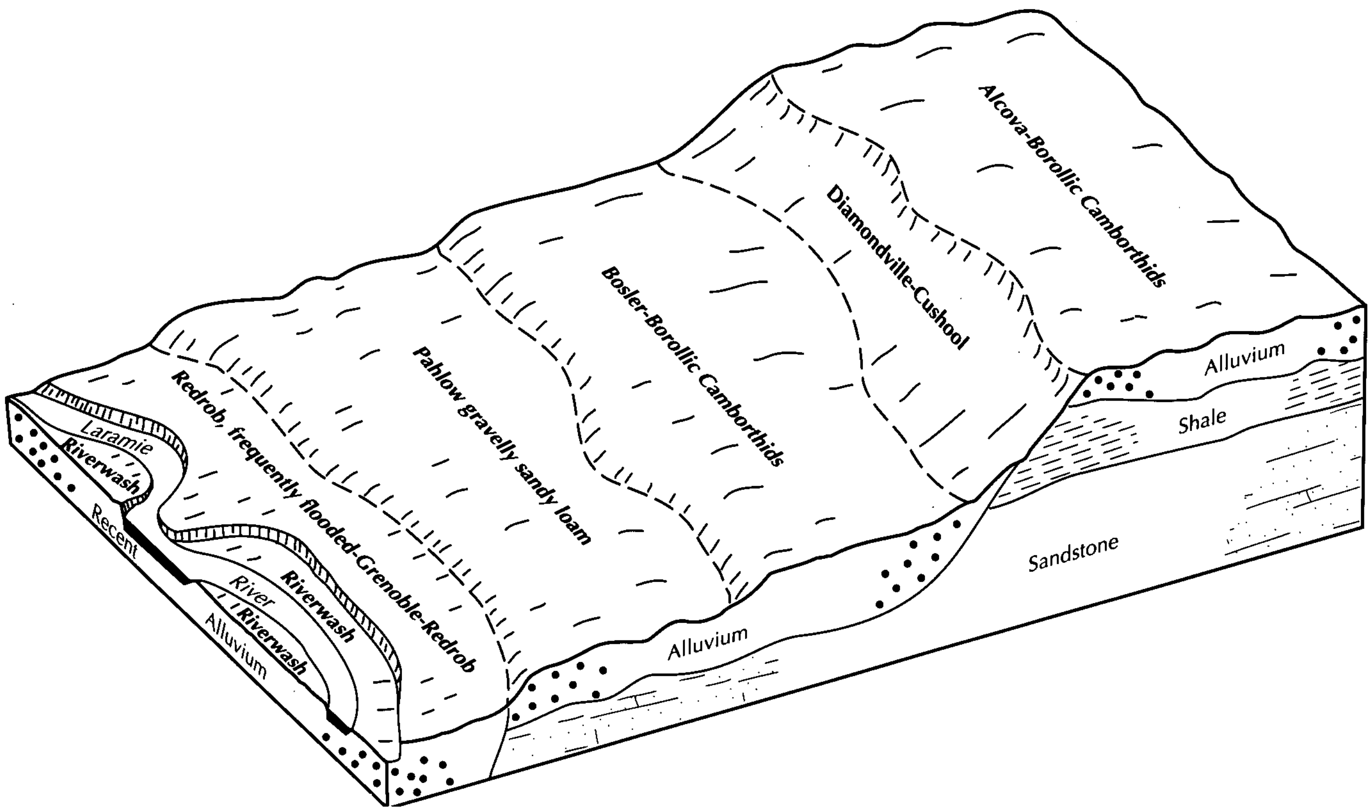

Figure 5.—A diagram of the relationship of some of the soils in the survey area to the parent materials in which they formed.

inches or more is commonly pale brown very gravelly sandy loam or very gravelly sandy clay loam.

Permeability of the Borollic Camborthids soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Alcova soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Borollic Camborthids soil is mainly needleandthread, Indian ricegrass, thickspike wheatgrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, silver sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This unit is moderately well suited for stockwater ponds. The moderate potential for seepage losses is the main limitation. The Alcova soil is moderately well suited for mechanical range renovation and for range seeding; the main limitation is the hazard of wind erosion. The Borollic Camborthids soil is poorly suited for mechanical range renovation and range seeding; the main limitation is the very gravelly surface layer. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

The Alcova soil is in capability subclass IVe, nonirrigated. The Borollic Camborthids soil is in capability subclass VIs, nonirrigated.

The Alcova soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The

Borollic Camborthids soil is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

103—Alcova, shallow substratum-Lupinto-Dahlquist complex, 0 to 8 percent slopes.

This map unit is on fan terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Alcova loam, 20 percent Lupinto gravelly fine sandy loam, and 15 percent Dahlquist very gravelly loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Browtine very gravelly fine sandy loam, Rock River sandy loam, and Stunner sandy loam. Included areas make up about 15 percent of the total acreage.

The Alcova soil is very deep and well drained. It formed in alluvium. Typically the surface is 25 percent covered with gravel. The surface layer is brown loam 2 inches thick. The upper part of the subsoil is yellowish brown clay loam and sandy clay loam 14 inches thick. The next part is very pale brown very gravelly loam 11 inches thick. The lower part is light yellowish brown extremely gravelly sandy loam to a depth of 60 inches or more.

Permeability of the Alcova soil is moderate in the upper part of the subsoil and rapid in the lower part. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

The Lupinto soil is very deep and well drained. It formed in alluvium. Typically the surface is covered with 10 percent gravel. The surface layer is brown gravelly fine sandy loam 2 inches thick. The upper part of the subsoil is dark yellowish brown sandy clay loam 5 inches thick. The next part is very pale brown very gravelly loam 17 inches thick. The lower part is very pale brown and light yellowish brown very gravelly sandy loam to a depth of 60 inches or more.

Permeability of the Lupinto soil is moderate in the upper part of the subsoil and rapid in the lower part. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

The Dahlquist soil is very deep and well drained. It formed in alluvium. Typically the surface is covered with 50 percent gravel and cobbles. The surface layer is brown very gravelly loam 4 inches thick. The upper part of the subsoil is strong brown and yellowish brown extremely gravelly sandy clay loam 16 inches thick. The lower part to a depth of 60 inches or more is yellowish brown extremely gravelly sandy loam.

Permeability of the Dahlquist soil is moderate in the upper part of the subsoil and rapid in the lower part. Available water capacity is very low. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Alcova and Lupinto soils is mainly bluebunch wheatgrass, needleandthread, mutton bluegrass, black sagebrush, fringed sagewort, and western wheatgrass. As the range condition deteriorates, blue grama, Sandberg bluegrass, and forbs increase. As the range condition further deteriorates, cheatgrass and gumweed invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Dahlquist soil is mainly bluebunch wheatgrass, western wheatgrass, little bluestem, and black sagebrush. As the range condition deteriorates, western wheatgrass and shrubs increase. As the range condition further deteriorates, annual forbs and weeds invade. The potential plant community produces about 1,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils and by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately well suited for mechanical range renovation and for range seeding; the main limitation is the gravel in the surface layer of the Lupinto and Dahquist soils. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community. The low annual precipitation should also be of concern when planning range seedings.

The Alcova and Lupinto soils are in capability subclass IVe, nonirrigated. The Dahlquist soil is in capability

subclass VIs, nonirrigated. The Alcova and Lupinto soils are in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site; the Dahlquist soil is in the Coarse Upland, 10- to 14-inch precipitation, High Plains Southeast range site.

104—Alcova, calcareous subsoil-Rock River complex, 0 to 8 percent slopes.

This map unit is on terraces and alluvial fan aprons with a mound-intermound pattern of microrelief. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 65 percent Alcova sandy loam and 20 percent Rock River very gravelly sandy loam. The Alcova soil occurs in intermound areas. The Rock River soil occurs on mounds. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Browtine very gravelly fine sandy loam, Forelle fine sandy loam, and Tisworth sandy loam. Also included are small areas of Borollic Camborthids soils. Included areas make up about 15 percent of the total acreage.

The Alcova soil is very deep and well drained. It formed in alluvium. Typically the surface layer is brown sandy loam 2 inches thick. The upper part of the subsoil is dark yellowish brown clay loam 14 inches thick. The next 12 inches are very pale brown clay loam. The lower part to a depth of 60 inches or more is pale brown very gravelly sandy loam.

Permeability of the Alcova soil is moderate in the upper part of the subsoil and rapid in the lower part. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Rock River soil is very deep and well drained. It formed in alluvium. Typically the surface is covered with 50 percent gravel. The surface layer is brown very gravelly sandy loam 2 inches thick. The upper part of the subsoil is dark yellowish brown and light yellowish brown gravelly sandy clay loam 8 inches thick. The lower part to a depth of 60 inches or more is yellowish brown gravelly sandy clay loam.

Permeability of the Rock River soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Alcova soil is mainly bluebunch wheatgrass, needleandthread, mutton bluegrass, black sagebrush, fringed sagewort, and western wheatgrass. As the range condition deteriorates, blue grama, Sandberg bluegrass, and forbs increase. As the range condition further deteriorates, cheatgrass and gumweed invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Rock River soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

The Alcova soil is poorly suited for stockwater ponds due to the potential for seepage losses. The Rock River soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation.

This unit is moderately well suited for mechanical range renovation and range seeding; the main limitations are the hazard of wind erosion on the Alcova soil and the very gravelly surface layer of the Rock River soil. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass IVe, nonirrigated. The Alcova soil is in the Shallow Loamy, 10- to 14-inch, High Plains Southeast range site; the Rock River soil is in the Loamy, 10- to 14-inch High Plains Southeast range site.

105—Almy loam, 0 to 8 percent slopes.

This very deep, well drained soil is on alluvial fan aprons. It formed in alluvium derived from reddish sandstone and shale. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Alogia loam, Forelle loam, Joemre fine sandy loam, Wycolo sandy loam, and a soil similar to the Almy soil but with a high amount of calcium carbonate in the lower subsoil. Included areas make up about 25 percent of the total acreage.

Typically the surface layer is reddish brown loam 2 inches thick. The upper part of the subsoil is reddish brown loam 9 inches thick. The next part is reddish yellow loam 11 inches thick. The next part is yellowish red sandy clay loam 13 inches thick. The lower part is yellowish red sandy loam to a depth of 60 inches or more.

Permeability of the Almy soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat. A few areas are used for irrigated hay and pasture.

This unit is well suited for irrigated hay and pasture. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff. Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. To avoid overirrigating and leaching of plant nutrients, applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

The potential plant community on this unit is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is well suited for mechanical range renovation and range seeding. The low annual precipitation should be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated and irrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

106—Almy-Urban land complex, 0 to 3 percent slopes.

This map unit is on terraces and foot slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This map unit is 65 percent Almy loam and 20 percent Urban land. The components of this unit are so intricately intermingled that is was not practical to map them separately at the scale used.

Included in this unit are small areas of Alogia loam, Forelle loam, Joemre fine sandy loam, and Wycolo sandy loam. Included areas make up about 15 percent of the total acreage.

The Almy soil is very deep and well drained. It formed in alluvium derived from reddish sandstone and shale. Typically the surface layer is reddish brown loam 2 inches thick. The upper part of the subsoil is reddish yellow loam 14 inches thick. The next part is yellowish red sandy clay loam 13 inches thick. The lower part is yellowish red sandy loam to a depth of 60 inches or more.

Permeability of the Almy soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

Urban land is covered with buildings, streets, and parking lots. The original soil is either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Red fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

If the Almy soil is used for urban development, the main limitation is the shrink-swell potential and the moderately restricted permeability. Foundations of buildings and paved roads should be designed to offset the effects of the shrinking and swelling of the soils. If a septic system will be used, the absorption lines should be placed in the more permeable lower subsoil layers.

The Almy soil is in capability subclass IVc, nonirrigated.

107—Almy-Tismid association, 0 to 8 percent slopes.

This map unit is on dip slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,300 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 55 percent Almy fine sandy loam, 0 to 3 percent slopes, and 35 percent Tismid sandy clay loam, 3 to 8 percent slopes. The Almy soil is in concave areas; the Tismid soil is on convex slopes.

Included in this unit are small areas of a moderately deep soil similar to the Tismid soil. Also included are areas of a soil similar to the Almy soil, but with bedrock at a depth of 40 to 60 inches. Included areas make up about 10 percent of the total acreage.

The Almy soil is very deep and well drained. It formed in alluvium and residuum derived dominantly from reddish sandstone and shale. Typically the surface layer is light brown fine sandy loam 2 inches thick. The upper 12 inches of the subsoil are strong brown clay loam. The next part is reddish brown sandy clay loam 24 inches thick. The lower part is light reddish brown very fine sandy loam to a depth of 60 inches or more.

Permeability of the Almy soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Tismid soil is very deep and well drained. It formed in alluvium. Typically the surface layer is reddish brown sandy clay loam 2 inches thick. The upper 5 inches of the subsoil are light reddish brown sandy clay loam. The next part is light reddish brown strongly alkaline sandy clay loam 7 inches thick. The lower part is light reddish brown sandy clay loam to a depth of 60 inches or more.

Permeability of the Tismid soil is moderately slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Almy soil is mainly bluebunch wheatgrass, needleandthread, black sagebrush, and western wheatgrass. As the range condition deteriorates, blue grama, Sandberg bluegrass, and black sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Tismid soil is mainly western wheatgrass, bottlebrush squirreltail, gardner saltbush, birdfoot sagebrush, and Indian ricegrass. As the range condition deteriorates, sagebrush increases. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 500 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the alkalinity of the Tismid soil and by the low annual precipitation. Loss of the surface layer of the Tismid soil results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing should be managed to protect the unit from excessive erosion.

The Almy soil is poorly suited for stockwater ponds due to the potential for seepage losses. The Tismid soil is well suited for stockwater ponds. The Almy soil is moderately well suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The Tismid soil is poorly suited for mechanical range renovation and range seeding; the main limitation is the alkalinity of the soil. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. If range seedings are planned on the Tismid soil, seeding rates should be increased and plant species carefully selected because of the alkalinity of the soil. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

The Almy soil is in capability subclass IVc, nonirrigated. The Tismid soil is in capability subclass VIs, nonirrigated. The Almy soil is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Tismid soil is in the Impervious Clay, 10- to 14-inch precipitation, High Plains Southeast range site.

108—Alogia loam, 0 to 3 percent slopes.

This very deep, moderately well drained soil is in seep areas and drainageways, and on alluvial fans and terraces adjacent to flood plains. This soil formed in alluvium

derived dominantly from reddish sandstone and shale. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Cantle loam in low areas adjacent to flood plains, and areas of Joemre fine sandy loam on higher terraces and alluvial fans. Also included are small areas of soils that are 20 to 40 inches deep to weakly consolidated shale or sandstone. Included areas make up about 15 percent of the total acreage.

Typically the surface layer is brown loam 3 inches thick. The upper part of the subsoil is brown loam 4 inches thick. The next 14 inches are light reddish brown clay loam. The lower part is pink loam 20 inches thick and contains many soft masses of gypsum. The substratum to a depth of 60 inches or more is reddish brown and reddish yellow clay loam and contains few to common soft masses of gypsum. The subsoil and substratum are slightly saline.

Permeability of the Alogia soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A water table fluctuates between 3 and 5 feet; the highest level is from April through July.

This unit is used as rangeland and for wildlife habitat. A few areas are used for irrigated hay and pasture.

The potential plant community on the Alogia soil is mainly alkali sacaton, basin wildrye, inland saltgrass, greasewood, and western wheatgrass. As the range condition deteriorates, greasewood and inland saltgrass increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,800 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,500 pounds in favorable years to 1,200 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the low annual precipitation and by the salinity of the soil.

This soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. Pits dug sufficiently below the level of the water table can provide water for livestock during the period of the year when the water table is at its highest level. It is poorly suited for mechanical range renovation or for range seeding; the main limitation is the salinity of the soil. The low annual precipitation should also be of concern when planning range seedings. If range seedings are conducted, seeding rates should be increased and plant species carefully selected because of the salinity of the soil.

If this unit is used for irrigated hay and pasture, the main limitation is the salinity of the soil. To avoid overirrigating and leaching of plant nutrients, applications of irrigation water should be adjusted to the available water capacity of the soil, the crop needs, and to the salt leaching requirement.

This unit is in capability subclass IVs, nonirrigated and irrigated. It is in the Saline Lowland, 10- to 14-inch precipitation, High Plains Southeast range site.

109—Alogia-Urban land complex, 0 to 3 percent slopes.

This map unit is in drainageways and on alluvial fans and terraces adjacent to flood plains. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This map unit is 70 percent Alogia loam and 15 percent Urban land. The components of this unit are so intricately intermingled that is was not practical to map them separately at the scale used.

Included in this unit are small areas of Joemre fine sandy loam on higher terraces and alluvial fans. Also included are small areas of soils that are 20 to 40 inches deep to weakly consolidated shale or sandstone. Included areas make up about 15 percent of the total acreage.

The Alogia soil is very deep and moderately well drained. It formed in alluvium derived dominantly from reddish sandstone and shale. Typically the surface layer is brown loam 3 inches thick. The upper part of the subsoil is brown and light reddish brown clay loam 18 inches thick. The lower part is pink loam 20 inches thick. The substratum is reddish brown and reddish yellow clay loam to a depth of 60 inches or more. The subsoil and substratum are slightly saline.

Permeability of the Alogia soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A water table fluctuates between a depth of 3 and 5 feet; the highest level is from April through July.

Urban land is covered with buildings, streets, and parking lots. The original soil is either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Red fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

If the Alogia soil is used for urban development, the main limitation is the high water table. Septic tank absorption fields buried in the soil do not function properly due the high water table. In addition, if several septic systems are installed in an area, the water added to the soil may raise the level of the water table. Use of this soil as a site for buildings with basements is not recommended due to the high water table.

The Alogia soil is in capability subclass IVs, nonirrigated.

110—Anchutz sandy loam, 1 to 8 percent slopes.

This very deep, well drained soil is on fan terraces. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

Included in this unit are small areas of Alcova sandy loam, Rawlins sandy loam, Rock River sandy loam, and Stunner sandy loam. Also included are small areas of Browtine very cobbly sandy loam on terrace breaks. Included areas make up about 20 percent of the total acreage.

Typically the surface layer is brown sandy loam 2 inches thick. The upper part of the subsoil is dark yellowish brown and yellowish brown sandy clay loam 13 inches thick. The next part is very pale brown clay loam and light yellowish brown sandy clay loam 24 inches thick. It contains a high amount of calcium carbonate. The lower part is light yellowish brown sandy loam to a depth of 60 inches or more.

Permeability of the Anchutz soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Anchutz soil is mainly bluebunch wheatgrass, western wheatgrass, and black sagebrush. As the range condition deteriorates, shorter grasses, sedges, and black sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the high amount of calcium carbonate in the soil. Loss of the surface layer results in a decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing also should be managed to protect the unit from excessive erosion.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is well suited for mechanical range renovation and range seeding. The low annual precipitation should be of concern when planning range seedings.

This unit is in capability subclass IVe, nonirrigated. It is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

111—Ansel-Granile gravelly sandy loams, 6 to 45 percent slopes.

This map unit is on foothills and mountain alluvial fans. The native vegetation consists mainly of coniferous forest. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

This unit is 40 percent Ansel soil and 40 percent Granile soil. The components of this unit are so intricately intermingled that is was not practical to map them separately at the scale used.

Included in this unit are small areas of Leavitt sandy loam and of Quander gravelly loam. Also included are small areas of a somewhat poorly drained soil that has a clayey substratum. Included areas make up about 20 percent of the total acreage.

The Ansel soil is very deep and well drained. It formed in alluvium derived from igneous and metamorphic rock. Typically the surface is covered with a 2-inch-thick layer of needle and bark residue. The surface layer is light brownish gray gravelly sandy loam 6 inches thick. The subsoil is light brown and light yellowish brown gravelly sandy clay loam 18 inches thick. The substratum is pale brown very gravelly sandy loam to a depth of 60 inches or more.

Permeability of the Ansel soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Granile soil is very deep and well drained. It formed in alluvium derived from igneous and metamorphic rock. Typically the surface is covered with a 1-inch-thick layer of partially decomposed pine needles. The surface

layer is light brownish gray gravelly sandy loam 2 inches thick. The subsurface layer is light gray and pale brown very gravelly sandy loam 13 inches thick. The subsoil is light yellowish brown very gravelly sandy clay loam 9 inches thick. The substratum is pale brown very gravelly sandy loam to a depth of 60 inches or more.

Permeability of the Granile soil is moderate. Available water capacity is very low. Effective rooting depth is 60 inches or more. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

This unit is used mainly for wildlife habitat, for recreation, and for post and pole production. A few areas are used for livestock grazing.

The present vegetation on this unit is lodgepole pine and understory consisting mainly of elk sedge, low sedge, creeping juniper, Oregongrape, kinnikinnick, Woods rose, heartleaf arnica, and aspen. Production of merchantable timber is about 40 to 50 cubic feet of lodgepole pine per acre per year. The site index for lodgepole pine is 50 to 60. The main limitations for timber production are steepness of the slope and the slow growth of the trees.

Production of vegetation suitable for livestock grazing is limited by the tree canopy cover, which limits the growth of the understory vegetation. If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

This unit is poorly suited for stockwater ponds due to the steepness of the slope.

This unit is in capability subclass VIIe, nonirrigated. It is lodgepole pine woodland.

112—Bateson-Shirleybasin association, 1 to 15 percent slopes.

This map unit is on dissected pediments adjacent to the Laramie Range. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,200 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Bateson gravelly sandy clay loam and 30 percent Shirleybasin loam. The Bateson soil is on knobs and pediment breaks with slopes of 8 to 15 percent. The Shirleybasin soil is on foot slopes of pediment breaks and on the broad summits of the pediments with slopes of 1 to 8 percent.

Included in this unit are small areas of Alcova sandy loam, Forelle loam, Rentsac sandy loam, and Rock River fine sandy loam. Also included are small areas of Rock outcrop. Included areas make up about 30 percent of the total acreage.

The Bateson soil is very deep and well drained. It formed in alluvium derived from various sources overlying residuum derived from tuffaceous conglomerate. Typically the surface is 25 percent covered with gravel. The surface layer is brown gravelly sandy clay loam 2 inches thick. The upper part of the subsoil is brown and dark brown gravelly sandy clay loam 19 inches thick. The next part is red very gravelly sandy loam 8 inches thick. The lower part is pink very gravelly loamy sand to a depth of 60 inches or more.

Permeability of the Bateson soil is moderate in the upper part of the subsoil and rapid in the lower part. Available water capacity is low. Effective rooting depth is 60 inches or more for some plants, but for others it is only 20 to 40 inches because the coarse textures in the lower subsoil limit root growth. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight.

The Shirleybasin soil is very deep and well drained. It formed in alluvium derived from tuffaceous sedimentary rocks. Typically the surface layer is brown loam 2 inches thick. The upper part of the subsoil is brown sandy clay loam 6 inches thick. The next part is brown clay loam 19 inches thick. The lower part is brown clay loam to a depth of 60 inches or more.

Permeability of the Shirleybasin soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat. It is also used for recreation.

The potential plant community on the Bateson soil is mainly bluebunch wheatgrass, western wheatgrass, mutton bluegrass, needleandthread, and black sagebrush. As the range condition deteriorates, threadleaf sedge and blue grama increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Shirleybasin soil is mainly western wheatgrass, needleandthread, bluebunch wheatgrass, and big sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual grasses and forbs invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the droughtiness of the Bateson soil.

The Bateson soil is poorly suited for stockwater ponds due to the potential for seepage losses. The Shirleybasin soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. The Bateson soil is moderately well suited for mechanical range renovation and range seeding; the main limitation is the gravelly surface layer. The Shirleybasin soil is well suited for mechanical range renovation and range seeding. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. The Bateson soil is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Shirleybasin soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

113—Blackhall-Browtine, moist, complex, 15 to 45 percent slopes.

This map unit is on hillslopes of dissected fan terraces. The native vegetation consists mainly of forbs and grasses. Elevation is 7,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Blackhall very gravelly fine sandy loam and 30 percent Browtine very gravelly sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Chaperton loam, Rawlins sandy loam, and Satanka fine sandy loam. Also included are small areas of soft and hard sandstone Rock outcrop. Included areas make about 20 percent of the total acreage.

The Blackhall soil is shallow and well drained. It formed in residuum derived from sandstone. Typically the surface is 30 percent covered with about 10 percent each gravel, cobbles, and stones. The surface layer is brown very gravelly fine sandy loam 2 inches thick. The subsoil is light yellowish brown fine sandy loam 5 inches thick. The substratum is very pale brown fine sandy loam 11 inches thick. Weakly consolidated platy sandstone is at a depth of 18 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Blackhall soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

The Browtine soil is very deep and well drained. It formed in alluvium. Typically the surface is 50 percent covered with gravel, cobbles, and a few stones. The surface layer is brown very gravelly sandy loam 3 inches thick. The subsoil is light yellowish brown very gravelly sandy loam and brownish yellow extremely gravelly sandy loam 16 inches thick. The upper part of the substratum is brownish yellow very gravelly coarse sandy loam and extremely cobbly coarse sandy loam 24 inches thick. The lower part is brownish yellow extremely gravelly sandy clay loam to a depth of 60 inches or more.

Permeability of the Browtine soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 60 inches or more for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate and gravel limits root growth. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Blackhall soil is mainly bluebunch wheatgrass, Indian ricegrass, and needleandthread. As the range condition deteriorates, threadleaf sedge increases. As the range condition further deteriorates, annual grasses and forbs invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Browtine soil is mainly bluebunch wheatgrass, Idaho fescue, western wheatgrass, and threetip sagebrush. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,300 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,700 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing should be managed to protect the unit from excessive erosion.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

This unit is in capability subclass VIIe, nonirrigated. The Blackhall soil is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. The Browtine soil is in the Coarse Upland, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

114—Blackhall-Satanka-Rock outcrop complex, 5 to 20 percent slopes.

This map unit is on ridges. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 35 percent Blackhall sandy loam, 30 percent Satanka fine sandy loam, and 20 percent Rock outcrop. The Blackhall soil is interspersed with Rock outcrop along ridgetops. The Satanka soil is on shoulders of ridges. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blazon loam and of Diamondville fine sandy loam. Included areas make up about 15 percent of the total acreage.

The Blackhall soil is shallow and well drained. It formed in residuum and colluvium derived from sandstone. Typically the surface is about 20 percent covered with channery fragments. The surface layer is pale brown sandy loam 2 inches thick. The subsoil is yellowish brown sandy loam 7 inches thick. The substratum is yellowish brown sandy loam 7 inches thick. Weakly consolidated sandstone is at a depth of 16 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Blackhall soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

The Satanka soil is moderately deep and well drained. It formed in alluvium and residuum derived from sedimentary rocks. Typically the surface layer is pale brown fine sandy loam 4 inches thick. The upper part of the subsoil is brown sandy clay loam 5 inches thick. The lower part is grayish brown and light gray sandy clay loam 26 inches thick. Weakly consolidated sandstone is at a depth of 35 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Satanka soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

Rock outcrop consists of exposures of sandstone and shale.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Blackhall soil is mainly bluebunch wheatgrass, Indian ricegrass, and needleandthread. As the range condition deteriorates, threadleaf sedge and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Satanka soil is mainly needleandthread, thickspike wheatgrass, Indian ricegrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, big sagebrush, rabbitbrush, and forbs increase. As the range condition further deteriorates, annuals and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the droughtiness of the Blackhall soil. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing should be managed to protect the unit from excessive erosion.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the hazards of wind and water erosion. The low annual precipitation should also be of concern when planning range seedings.

Tillage of areas with a slope of more than 15 percent for range improvement is not recommended. Interseeding and seedbed preparation by band spraying of herbicides can be used in these areas. If tillage for range improvement in used on the less sloping areas, adequate

residue to reduce the hazards of wind and water erosion must be maintained on the surface at all times until the seeding is established. Areas tilled for seeding must remain narrow and at right angles to the wind. If practical, tillage should be along the contour of the slope.

The Blackhall soil is in capability subclass VIIe, nonirrigated. The Satanka soil is in capability subclass VIe, nonirrigated. Rock outcrop is in capability class VIII.

The Blackhall soil is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. The Satanka soil is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near the Platte County line near Highway 34 are in similar range sites in the 12- to 14-inch precipitation, Southern Plains zone.

115—Blazon-Chaperton complex, moist, 3 to 20 percent slopes.

This map unit is on hills. The native vegetation consists mainly of grasses and forbs. Elevation is 6,500 to 6,800 feet. The annual precipitation is 15 to 17 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Blazon loam and 30 percent Chaperton clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blackhall sandy loam, Delphill clay loam, and Diamondville fine sandy loam. Also included are areas of shale and sandstone Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Blazon soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from shale, loamstone, and sandstone. Typically the surface layer is pale brown loam 5 inches thick. The underlying material is light brownish gray clay loam 10 inches thick. Weakly consolidated shale is at a depth of 15 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Blazon soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Chaperton soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from shale, loamstone, and sandstone. Typically the surface layer is light brownish gray clay loam 3 inches thick. The upper part of the subsoil is brownish gray clay loam 12 inches thick. The lower part is light brownish gray clay loam 9 inches thick. Weakly consolidated shale is at a depth of 24 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Chaperton soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the the Blazon soil is mainly western wheatgrass, green needlegrass, blue grama, winterfat, and bluebunch wheatgrass. As the range condition deteriorates, blue grama and buffalograss increase. As the range condition further deteriorates, broom snakeweed and annuals invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the the Chaperton soil is mainly western wheatgrass and green needlegrass. As the range condition deteriorates, blue grama and buffalograss increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,300 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,700 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. On the Blazon soil, production of vegetation suitable for livestock grazing is limited by droughtiness of the soil. The Chaperton soil is well suited to this production. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing should be managed to protect the unit from excessive erosion.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the slope. It is poorly suited for mechanical range renovation and range seeding; the main limitation is the hazard of water erosion. The low annual precipitation should also be of concern when planning range seedings.

Tillage of areas with a slope of more than 15 percent for range improvement is not recommended. Interseeding and seedbed preparation by band spraying of herbicides can be used in these areas. If tillage for range improvement in used on the less sloping areas, adequate residue to reduce the hazard of water erosion must be

maintained on the surface at all times until the seeding is established. Tillage should be along the contour of the slope.

The Blazon soil is in capability subclass VIIe, nonirrigated. The Chaperton soil is in capability subclass VIe, nonirrigated. The Blazon soil is in the Shallow Loamy, 15- to 17-inch precipitation, Southern Plains range site. The Chaperton soil is in the Clayey, 15- to 17-inch precipitation, Southern Plains range site.

116-Blazon-Delphill complex, 20 to 45 percent slopes.

This map unit is on escarpments. The native vegetation consists mainly of grasses. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Blazon loam and 25 percent Delphill clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blackhall sandy loam, Cushool sandy loam, and Diamondville fine sandy loam. Also included are areas of shale and sandstone Rock outcrop. Included areas make up about 30 percent of the total acreage.

The Blazon soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from interbedded shale and sandstone. Typically the surface layer is pale brown loam 5 inches thick. The underlying material is light brownish gray clay loam 10 inches thick. Weakly consolidated shale is at a depth of 15 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Blazon soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Delphill soil is moderately deep and well drained. It formed in residuum and local alluvium derived dominantly from interbedded shale and sandstone. Typically the surface layer is light brownish gray clay loam 3 inches thick. The underlying material is light brownish gray clay loam 25 inches thick. Weakly consolidated shale is at a depth of 28 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Delphill soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the the Blazon soil is mainly bluebunch wheatgrass, western wheatgrass, bottlebrush squirreltail, mutton bluegrass, and winterfat. As the range condition deteriorates, shorter grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 800 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,000 pounds in favorable years to 500 pounds in unfavorable years.

The potential plant community on the the Delphill soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing.

Production of vegetation on the Blazon soil suitable for livestock grazing is limited by the droughtiness of the soil. The Delphill soil is well suited to this production. This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

This unit is in capability subclass VIIe, nonirrigated. The Blazon soil is in the Shallow Clayey, 10- to 14-inch precipitation, High Plains Southeast range site. The Delphill soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch precipitation, Southern Plains zone.

117—Bonjea-Chugcreek-Rock outcrop complex, 3 to 15 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 35 percent Bonjea sandy loam, 30 percent Chugcreek sandy loam, and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Boyle gravelly sandy loam and Lininger loam. Included areas make up about 15 percent of the total acreage.

The Bonjea soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite and gneiss. Typically the surface is brown sandy loam 4 inches thick. The upper 6 inches of the subsoil are brown sandy clay loam. The lower 5 inches are yellowish brown gravelly sandy clay loam. Hard granite is at a depth of 15 inches. Depth to bedrock ranges from 10 to 20 inches. In some areas, the surface layer is fine sandy loam.

Permeability of the Bonjea soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Chugcreek soil is moderately deep and well drained. It formed in alluvium and colluvium derived dominantly from granite and gneiss. Typically the surface is 10 percent covered with granitic gravel. The surface layer is brown sandy loam 4 inches thick. The upper 15 inches of the subsoil are dark yellowish brown sandy loam. The next 10 inches are dark yellowish brown sandy clay loam. The lower 9 inches are yellowish brown gravelly sandy clay loam. Hard granite is at a depth of 38 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Chugcreek soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

Rock outcrop consists of exposures of granite and gneiss.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Bonjea soil is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Chugcreek soil is mainly bluebunch wheatgrass, Griffith wheatgrass, prairie junegrass, big sagebrush, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation on the Bonjea soil suitable for livestock grazing is limited by the droughtiness of the soil. The Chugcreek is well suited to this production.

This unit is poorly suited for stockwater ponds due to the depth to bedrock. It is also poorly suited for mechanical range renovation and range seeding. Tillage for range improvement is not recommended due to the areas of Rock outcrop which occur throughout the unit.

The Bonjea soil is in capability subclass VIIs, nonirrigated. The Chugcreek soil is in capability subclass IVe, nonirrigated. Rock outcrop is in capability subclass VIIIs.

The Bonjea soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Chugcreek soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

118—Bonjea-Rock outcrop-Chugcreek complex, 15 to 40 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Bonjea sandy loam, 25 percent Rock outcrop, and 20 percent Chugcreek sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Boyle gravelly sandy loam, Lininger loam, and a very shallow soil similar to the Bonjea soil. Included areas make up about 15 percent of the total acreage.

The Bonjea soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite and gneiss. The surface layer is brown sandy loam 4 inches thick. The upper 6 inches of the subsoil are brown sandy clay loam. The lower 5 inches of the subsoil are yellowish brown gravelly sandy clay loam. Hard granite is at a depth of 15 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Bonjea soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

Rock outcrop consists of exposures of granite and gneiss.

The Chugcreek soil is moderately deep and well drained. It formed in alluvium and colluvium derived dominantly from granite and gneiss. Typically the surface layer is brown sandy loam about 5 inches thick. The upper part of the subsoil is dark brown sandy clay loam 12 inches thick. The lower part is brown sandy clay loam and clay loam 17 inches thick. The substratum is dark yellowish brown gravelly clay loam 2 inches thick. Hard granite is at a depth of 36 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Chugcreek soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Bonjea soil is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Chugcreek soil is mainly bluebunch wheatgrass, Griffith wheatgrass, prairie junegrass, big sagebrush, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion.

Production of vegetation on the Bonjea soil suitable for livestock grazing is limited by the droughtiness of the soil. The Chugcreek is well suited to the production. This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Bonjea and Chugcreek soils are in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Bonjea soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Chugcreek soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

119—Bosler fine sandy loam, wet substratum, 0 to 3 percent slopes.

This very deep, moderately well drained soil is on alluvial fans and terraces. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Cantle loam and Redrob loam. Included areas make up about 20 percent of the total acreage.

Typically the surface layer is grayish brown fine sandy loam 3 inches thick. The upper part of the subsoil is brown and yellowish brown sandy clay loam 17 inches thick. The lower part is yellowish brown very gravelly sand to a depth of 60 inches or more.

Permeability of the Bosler soil is moderate in the upper part of the subsoil and rapid in the lower part. Available water capacity is low. Effective rooting depth is 60 inches or more for some plants, but for others it is only 18 to 36 inches because of the water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe. A seasonal high water table fluctuates between 1.5 and 3 feet from April through September. The water table is the result of irrigation of this soil and the adjacent soils.

This unit is used for irrigated hay and pasture. It is also used as rangeland and for wildlife habitat.

If this unit is used for irrigated hay and pasture, the main limitations are wetness, droughtiness, and salinity of the soil. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Bosler soil is mainly alkali sacaton, basin wildrye, black greasewood,

and western wheatgrass. As the range condition deteriorates, greasewood and inland saltgrass increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,800 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,500 pounds in favorable years to 1,200 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the salinity of the soil and by the low annual precipitation.

This soil is well suited for stockwater ponds. Pits dug sufficiently below the level of the water table can provide water for livestock. This soil is moderately well suited for mechanical range renovation and range seeding; the main limitations are the hazard of wind erosion and the salinity of the soil. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Areas tilled for seeding must remain narrow and at right angles to the wind. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity of the soil.

This unit is in capability subclass IVw, nonirrigated and irrigated. It is in the Saline Lowland, 10- to 14-inch precipitation, High Plains Southeast range site.

120—Bosler-Borollic Camborthids complex, 0 to 8 percent slopes.

This map unit is on alluvial fans and terraces with a mound-intermound pattern of microrelief. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Bosler fine sandy loam and 35 percent Borollic Camborthids soil. The Bosler soil is on toe slopes of the mounds and in intermound areas. The Borollic Camborthids soil is on mounds. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Alcova sandy loam, Forelle loam, and Tisworth fine sandy loam. Also included are small areas of similar soils with redder colors. Included areas make up about 20 percent of the total acreage.

The Bosler soil is very deep and well drained. It formed in alluvium. Typically the surface layer is grayish brown fine sandy loam 7 inches thick. The upper part of the subsoil is brown sandy clay loam about 8 inches thick. The lower part is pale brown sandy clay loam and very pale brown loam 15 inches thick. The substratum is very pale brown very gravelly sand to a depth of 60 inches or more.

Permeability of the Bosler soil is moderate in the subsoil and rapid in the substratum. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Borollic Camborthids soil is very deep and well drained. It formed in alluvium. These soils vary from area to area, and no single profile is typical. Commonly, the surface is 30 percent covered with fine gravel. The surface layer is commonly pale brown gravelly sandy loam or very gravelly sandy loam about 3 inches thick. The upper part of the subsoil is commonly yellowish brown gravelly sandy clay loam or very gravelly sandy loam about 9 inches thick. The lower part to a depth of 60 inches or more is commonly light yellowish brown very gravelly sandy loam or very gravelly sandy clay loam.

Permeability of the Borollic Camborthids soil is moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Bosler soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Borollic Camborthids soil is mainly needleandthread, Indian ricegrass, thickspike wheatgrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, silver sagebrush, rabbitbrush, and cactus increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less

preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing in this unit is moderately limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the potential for seepage losses. This unit is moderately well suited for mechanical range renovation and range seeding; the main limitations are the gravelly surface layer of the Borollic Camborthids soil and the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of brush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

The Bosler soil is in capability subclass IVe, nonirrigated. The Borollic Camborthids soil is in capability subclass VIs, nonirrigated. The Bosler soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Borollic Camborthids soil is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

121—Bosler, wet substratum-Urban land complex, 0 to 3 percent slopes.

This map unit is on terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This map unit is 50 percent Bosler fine sandy loam and 30 percent Urban land. The components of this unit are so intricately intermingled that is was not practical to map them separately at the scale used.

Included in this unit are small areas of Alcova sandy loam and Rock River sandy loam. Also included are small areas of Borollic Camborthids soils on mounds. Included areas make up about 20 percent of the total acreage.

The Bosler soil is very deep and well drained. It formed in alluvium. Typically the surface layer is grayish brown fine sandy loam 3 inches thick. The upper part of the subsoil is brown sandy clay loam 17 inches thick. The lower part is yellowish brown very gravelly sand to a depth of 60 inches or more.

Permeability of the Bosler soil is moderate in the upper part of the subsoil and rapid in the lower part. Available water capacity is low. Effective rooting depth is 60 inches for some plants, but for others it is 18 to 36 inches because of the water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe. A seasonal high water table fluctuates between a depth of 1.5 and 3 feet from April through September. The water table results from the irrigation of this soil and/or adjacent soils.

Urban land is covered with buildings, streets, and parking lots. The original soil is either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Reddish fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

If the Bosler soil is used for urban development, the main limitation is the high water table. Septic tank absorption fields buried in the soil do not function properly due the high water table. In addition, if several septic systems are installed in an area, the water added to the soil may raise the level of the water table. Use of this soil as a site for buildings with basements is not recommended due to the high water table.

The Bosler soil is in capability subclass IVw, nonirrigated.

122—Boyle-Alderon-Cathedral gravelly sandy loams, 5 to 25 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses, shrubs, and trees. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 35 percent Boyle gravelly sandy loam, 30 percent Alderon gravelly sandy loam, and 15 percent Cathedral gravelly sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Dalecreek sandy loam, Lininger loam, and Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Boyle soil is shallow and well drained. It formed in residuum derived dominantly from granite. Typically the surface is 70 percent covered with small granitic gravel. The surface layer is brown gravelly sandy loam 2 inches thick. The subsoil is brown very gravelly sandy clay loam 8 inches thick. Weakly consolidated granite is at a depth of 10 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Boyle soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight. Winter winds remove the snow from the surface of this soil.

The Alderon soil is moderately deep and well drained. It formed in residuum and colluvium derived from granite. Typically the surface is covered with a mat of needles,

twigs, and bark 3 inches thick. The surface layer is brown gravelly sandy loam 6 inches thick. The subsoil is yellowish brown and strong brown gravelly sandy clay loam 28 inches thick. The substratum is yellowish brown very gravelly sandy loam 6 inches thick. Weakly consolidated granite is at a depth of 40 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Alderon soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Cathedral soil is shallow and well drained. It formed in residuum and colluvium derived from granite. Typically the surface is covered with 50 percent granitic gravel and cobbles. The surface layer is brown gravelly sandy loam 7 inches thick. The underlying material is dark yellowish brown very gravelly coarse sandy loam. Hard granite is at a depth of 14 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Cathedral soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is moderate. The hazard of wind erosion is moderate. Winter winds remove the snow from the surface of this soil.

This unit is used mainly as rangeland and for wildlife habitat. A few small areas are used for recreation and for limited harvesting of wood products.

The potential plant community on the Boyle soil is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

The present vegetation on the Alderon soil is lodgepole pine with an understory of king spike fescue, elk sedge, low sedge, heartleaf arnica, Rocky Mountain maple, creeping juniper, currant, snowberry, antelope bitterbrush, mountain brome, bluebells, western yarrow, kinnikinnick, rose pussytoes, Richardson's geranium, bedstraw, and Woods rose.

The potential plant community on the Cathedral soil is mainly bluebunch wheatgrass, black sagebrush, threetip sagebrush, and slimstem muhly. As the range condition deteriorates, threadleaf sedge and low rabbitbrush increase. As the range condition further deteriorates, broom snakeweed and annuals invade. The potential plant community produces about 550 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the Boyle and Cathedral soils and by the tree canopy cover on the Alderon soil.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the gravelly surface layer of the Boyle and Cathedral soils, the tree cover on the Alderon soil, and the hazard of water erosion.

The Alderon soil is moderately well suited to timber production. The site index for lodgepole pine ranges from 35 to 50. Production of merchantable timber is about 25 to 40 cubic feet of lodgepole pine per acre per year. The main limitation for timber production is the slow growth of the trees.

The Boyle and Cathedral soils are in capability subclass VIIe, nonirrigated. The Alderon soil is in capability subclass VIe, nonirrigated. The Boyle soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Cathedral soil is in the Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

123—Boyle-Boyle, thin solum, gravelly sandy loams, 3 to 6 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Boyle gravelly sandy loam and 40 percent Boyle gravelly sandy loam, thin solum. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Cathedral gravelly coarse sandy loam, Dalecreek sandy loam, Lininger loam, and Rock outcrop. Included areas make up about 15 percent of the total acreage.

The Boyle soil is shallow and well drained. It formed in residuum derived dominantly from granite. Typically the surface is 70 percent covered with fine granitic gravel. The

surface layer is brown gravelly sandy loam about 3 inches thick. The subsoil is reddish brown very gravelly sandy clay loam 10 inches thick. Weakly consolidated granite is at a depth of 13 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Boyle soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight. Winter winds remove the snow from the surface of this soil.

The Boyle, thin solum soil is very shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is 80 percent covered with fine granitic gravel. The surface layer is brown gravelly sandy loam 2 inches thick. The subsoil is brown very gravelly sandy clay loam 7 inches thick. Weakly consolidated granite at a depth of 9 inches. Depth to bedrock ranges from 7 to 10 inches. This soil is outside the characteristics of the Boyle series because the depth to bedrock is less than 10 inches. This difference, however, does not significantly affect the use and management of this soil.

Permeability of the Boyle, thin solum soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 7 to 10 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight. Winter winds remove the snow from the surface of this soil.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Boyle soil is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Boyle, thin solum soil is mainly bluebunch wheatgrass, black sagebrush, threetip sagebrush, and slimstem muhly. As the range condition deteriorates, threadleaf sedge and low rabbitbrush increase. As the range condition further deteriorates, broom snakeweed and annuals invade. The potential plant community produces about 550 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds due to the depth to bedrock. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the gravelly surface layer, depth to bedrock, and the droughtiness of the soils.

This unit is in capability subclass VIIs, nonirrigated. The Boyle soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Boyle, thin solum soil is in the Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

124—Boyle-Rock outcrop complex, 5 to 25 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Boyle gravelly sandy loam and 30 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Cathedral gravelly coarse sandy loam and Lininger loam. Included areas make up about 20 percent of the total acreage.

The Boyle soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is 45 percent covered with small granitic gravel. The surface layer is brown gravelly sandy loam 3 inches thick. The subsoil is brown very gravelly sandy clay loam 14 inches thick. Weakly consolidated granite is at a depth of 17 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Boyle soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight. Winter winds remove the snow from the surface of this soil.

Rock outcrop consists of exposures of hard granite and highly weathered granite saprolite.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed,

and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the gravelly surface layer, depth to bedrock, and the droughtiness of the soils.

The Boyle soil is in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Boyle soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. Areas of this map unit near Iron Mountain are in a similar range site in the 15- to 17-inch precipitation Southern Plains zone.

125—Boyle-Lininger association, 1 to 15 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Boyle gravelly sandy loam, 1 to 15 percent slopes and 30 percent Lininger loam, 1 to 8 percent slopes. The Boyle soil is on the crests of foothills and on the upper parts of mountain slopes. The Lininger soil is on the foot slopes and lower parts of mountain slopes and foothills, and in swales on mountain slopes.

Included in this unit are small areas of Bonjea sandy loam, Cathedral gravelly coarse sandy loam, Chugcreek sandy loam, Dalecreek sandy loam, and Rock outcrop. Included areas make up about 25 percent of the total acreage.

The Boyle soil is shallow and well drained. It formed in residuum derived dominantly from granite. Typically the surface is 30 percent covered with small granitic gravel. The surface layer is brown gravelly sandy loam 3 inches thick. The upper 3 inches of the subsoil are brown gravelly sandy clay loam. The lower 6 inches are brown very gravelly sandy clay loam. Weakly consolidated granite is at a depth of 12 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Boyle soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight. Winter winds remove the snow from the surface of this soil.

The Lininger soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from granite. Typically the surface is 30 percent covered with fine granitic gravel. The surface layer is brown loam 7 inches thick. The upper part of the subsoil is brown gravelly sandy clay loam 7 inches thick. The lower part is strong brown and brown very gravelly sandy clay loam 10 inches thick. Weakly consolidated granite is at a depth of 24 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Lininger soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate. Winter winds deposit additional snow on this soil.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the slope. It is also poorly suited for mechanical range renovation and range seeding; the main limitations are the gravelly surface layer, the hazard of water erosion, and the droughtiness of the soils.

The Boyle soil is in capability subclass VIIs, nonirrigated, and the Lininger soil is in capability subclass VIs, nonirrigated. This unit is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

126—Browtine very gravelly fine sandy loam, 0 to 8 percent slopes.

This very deep, well drained soil is on fan terraces. It formed in alluvium. The native vegetation consists mainly

of grasses and shrubs. Elevation is 6,800 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

Included in this unit are small areas of Blackhall very gravelly fine sandy loam and of Dahlquist very gravelly sandy loam. Also included are small areas of Hanson gravelly sandy loam at higher elevations. Included areas make up about 20 percent of the total acreage.

Typically the surface is about 20 percent covered with fine gravel and a few cobbles. The upper 3 inches of the surface layer is brown very gravelly fine sandy loam. The lower 6 inches are pale brown very gravelly sandy loam. The upper part of the subsoil is white very gravelly sandy loam 5 inches thick. The lower part is white extremely gravelly loam about 17 inches thick. The substratum is brownish yellow extremely gravelly coarse sandy loam to a depth of 60 inches or more. The subsoil contains a high amount of calcium carbonate.

Permeability of the Browtine soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 60 inches or more for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Browtine soil is mainly bluebunch wheatgrass, Indian ricegrass, prairie junegrass, and needleandthread. As the range condition deteriorates, needleleaf sedge and rabbitbrush increase. As the range condition further deteriorates, annual grasses and forbs invade. The potential plant community produces about 450 pounds of air-dry vegetation per acre in normal years. Production ranges from 650 pounds in favorable years to 300 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soil and by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is poorly suited for mechanical range renovation and range seeding; the main limitation is the very gravelly surface layer. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer and the droughtiness of the soil. The low annual precipitation should also be of concern when planning range seedings.

This unit is in capability subclass VIs, nonirrigated. It is in the Gravelly, 10- to 14-inch precipitation, High Plains Southeast range site.

127—Browtine-Hilltoppe very gravelly sandy loams, 0 to 8 percent slopes.

This map unit is on fan terraces. The native vegetation consists mainly of grasses. Elevation is 7,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 60 percent Browtine soil and 30 percent Hilltoppe soil. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Folavar very gravelly sandy loam and of Manada sandy loam. Included areas make up about 10 percent of the total acreage.

The Browtine soil is very deep and well drained. It formed in alluvium. Typically the surface is 10 percent covered, with about 5 percent gravel and 5 percent cobbles. The surface layer is brown very gravelly sandy loam 5 inches thick. The upper part of the subsoil is pale brown extremely gravelly sandy loam 7 inches thick. The next part is light gray extremely gravelly loam 10 inches thick. The next 20 inches are very pale brown extremely gravelly sandy loam. The substratum is pale brown extremely gravelly sandy loam to a depth of 60 inches or more. The subsoil contains a high amount of calcium carbonate.

Permeability of the Browtine soil is moderately rapid. Available water capacity is very low. Effective rooting depth for some plants is 60 inches or more, but for others it is only 15 to 30 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight.

The Hilltoppe soil is shallow and well drained. It formed in alluvium. Typically the surface is about 30 percent covered with gravel. The surface layer is brown very gravelly sandy loam 3 inches thick. The upper part of the subsoil is pale brown very gravelly sandy loam and very pale brown extremely gravelly sandy loam 11 inches thick. The next 19 inches are a layer of calcium carbonate-cemented gravel and fine cobbles. The substratum is pale brown extremely gravelly sandy loam to a depth of 60 inches or more.

Permeability of the Hilltoppe soil is moderately rapid above the cemented layer. Available water capacity is very low. Effective rooting depth is 10 to 20 inches because the cemented layer restricts root growth. Runoff is slow and

the hazard of water erosion is moderate. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for irrigated hay and pasture. It is also used for wildlife habitat.

If this unit is used for hay and pasture, the main limitations are droughtiness of the soils and the restricted rooting depth of the Hilltoppe soil. To avoid overirrigating and leaching of plant nutrients, applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. Frequent applications of irrigation water will be necessary because of the limited available water capacity of the soil. Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Browtine soil is mainly bluebunch wheatgrass, Indian ricegrass, prairie junegrass, and needleandthread. As the range condition deteriorates, needleleaf sedge and rabbitbrush increase. As the range condition further deteriorates, annual grasses and forbs invade. The potential plant community produces about 450 pounds of air-dry vegetation per acre in normal years. Production ranges from 650 pounds in favorable years to 300 pounds in unfavorable years.

The potential plant community on the Hilltoppe soil is mainly bluebunch wheatgrass, western wheatgrass, and bottlebrush squirreltail. As the range condition deteriorates, black sagebrush and threadleaf sedge increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 450 pounds of air-dry vegetation per acre in normal years. Production ranges from 600 pounds in favorable years to 250 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils and by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the potential for seepage losses. The cemented layer in the Hilltoppe soil also limits the development of stockwater ponds. The unit also is poorly suited for mechanical range renovation and range seeding; the main limitation is the very gravelly surface layer. Mechanical range renovation may not be economically feasible due to the coarse texture of the surface layer and the droughtiness of the soil. The low annual precipitation should also be of concern when planning range seedings.

The Browtine soil is in capability subclass VIs, nonirrigated and irrigated. The Hilltoppe soil is in capability subclass VIIs, nonirrigated and irrigated. The Browtine soil is in the Gravelly, 10- to 14-inch precipitation, High Plains Southeast range site. The Hilltoppe soil is in the Very Shallow, 10- to 14-inch precipitation, High Plains Southeast range site.

128—Bruja-Canwall-Telecan association, 3 to 60 percent slopes.

This map unit is on canyon sides and in valleys. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 30 percent Bruja very cobbly very fine sandy loam, 20 to 60 percent slopes; 25 percent Canwall gravelly fine sandy loam, 10 to 30 percent slopes; and 15 percent Telecan fine sandy loam, 3 to 6 percent slopes. Bruja is on north- and south-facing canyon sides. Canwall is on north-facing canyon sides. Telecan is in the valley bottoms.

Included in this unit is limestone or sandstone Rock outcrop occurring predominantly as resistant ledges. Also included are areas of Pilotpeak cobbly very fine sandy loam and a soil similar to the Telecan soil, but with bedrock at a depth of 30 to 60 inches. Included areas make up about 30 percent of the total acreage.

The Bruja soil is moderately deep and well drained. It formed in residuum and colluvium derived from interbedded sandstone and limestone. Typically the surface layer is 90 percent covered with gravel and cobbles. The surface layer is yellowish brown very cobbly very fine sandy loam 5 inches thick. The subsoil is light yellowish brown very cobbly very fine sandy loam and pale brown extremely cobbly very fine sandy loam 18 inches thick. Fractured interbedded sandstone and limestone is at a depth of 23 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Bruja soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

The Canwall soil is moderately deep and well drained. It formed in eolian deposits, colluvium derived from limestone, and sandstone overlying residuum derived from limestone. Typically the surface is 25 percent covered with cobbles. The surface layer is dark yellowish

brown gravelly fine sandy loam 3 inches thick. The upper 9 inches of the subsoil are brown gravelly fine sandy loam. The next 5 inches are brown very cobbly fine sandy loam. The lower part is pink very cobbly fine sandy loam 9 inches thick. Hard limestone is at a depth of 26 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Canwall soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Telecan soil is very deep and well drained. It formed in alluvium derived dominantly from interbedded sandstone and limestone. Typically the surface layer is brown fine sandy loam 4 inches thick. The upper 12 inches of the subsoil are dark brown fine sandy loam. The next 11 inches are dark yellowish brown fine sandy loam. The lower part is dark brown very fine sandy loam and brown fine sandy loam to a depth of 60 inches or more.

Permeability of the Telecan soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used as rangeland, for wildlife habitat, and for recreation.

The potential plant community on the Bruja soil is mainly bluebunch wheatgrass, western wheatgrass, needleandthread, and mountainmahogany. As the range condition deteriorates, threadleaf sedge, rabbitbrush, and shorter grass species increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 600 pounds of air-dry vegetation per acre in normal years. Production ranges from 800 pounds in favorable years to 350 pounds in unfavorable years.

The potential plant community on the Canwall soil is mainly bluebunch wheatgrass, Indian ricegrass, and needleandthread. As the range condition deteriorates, shorter species of grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Telecan soil is mainly needleandthread, thickspike wheatgrass, Indian ricegrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation on the Bruja and Canwall soils suitable for livestock grazing is limited by the droughtiness of the soils. The Telecan is well suited to this production.

The Bruja and Canwall soils are poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope. The Telecan soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately well suited for range seeding. The main limitation is the hazard of wind erosion. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Mechanical range renovation on the Telecan soil may not be practical due to the amount of sagebrush in the plant community. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

The Bruja soil is in capability subclass VIIe, nonirrigated. The Canwall soil is in capability subclass VIe, nonirrigated. The Telecan soil is in capability subclass IVe, nonirrigated. The Bruja soil is in the Rocky Hills, 10- to 14-inch precipitation, High Plains Southeast range site. The Canwall soil is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. The Telecan soil is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in the 15- to 17-inch precipitation Southern Plains zone.

129—Buffork-Bucklon sandy loams, 15 to 60 percent slopes.

This map unit is on foothills, ridges, and escarpments. The native vegetation consists mainly of grasses, forbs, and shrubs. Elevation is 7,600 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 40 percent Buffork sandy loam and 30 percent Bucklon sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Leavitt sandy loam and Quander gravelly loam. Also included are small

areas of sandstone and conglomerate Rock outcrop. Included areas make up about 30 percent of the total acreage.

The Buffork soil is moderately deep and well drained. It formed in colluvium and residuum derived dominantly from sedimentary rock. Typically the surface is 10 percent covered with 5 percent gravel and 5 percent cobbles. The surface layer is dark grayish brown and brown sandy loam 7 inches thick. The subsoil is brown sandy clay loam 10 inches thick. The substratum is light yellowish brown coarse sandy loam 9 inches thick. Weakly consolidated, coarse-grained sandstone is at a depth of 26 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Buffork soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

The Bucklon soil is shallow and well drained. It formed in colluvium and residuum derived dominantly from sedimentary rock. Typically the surface is 10 percent covered with gravel and a few cobbles. The surface layer is brown sandy loam 6 inches thick. The underlying material is light brownish gray and light yellowish brown loam 10 nches thick. Weakly consolidated sandstone is at a depth of 16 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Bucklon soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe. Slumping of this soil is common.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Buffork soil is mainly bluebunch wheatgrass, Griffith wheatgrass, prairie junegrass, and Idaho fescue. As the range condition deteriorates, Sandberg bluegrass, blue grama, and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Bucklon soil is mainly bluebunch wheatgrass, Griffith wheatgrass, and sagebrush. As the range condition deteriorates, Sandberg bluegrass, prairie junegrass, and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. The Production ranges from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing also should be managed to protect the unit from excessive erosion.

The Buffork soil is well suited to the production of vegetation suitable for livestock grazing. Production on the Bucklon soil is limited by droughtiness of the soil. This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The unit is in capability subclass VIIe, nonirrigated. The Buffork soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Bucklon soil is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

130—Byrnie-Rock outcrop complex, 10 to 50 percent slopes.

This map unit is on escarpments and hillslopes. Blowout areas are a common landscape feature. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Byrnie sandy loam and 30 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Joemre fine sandy loam, Rohonda fine sandy loam, Thermopolis fine sandy loam, and Wycolo sandy loam. Also included are small areas of a reddish sandy soil that has bedrock at a depth of 20 to 40 inches. Included areas make up about 20 percent of the total acreage.

The Byrnie soil is shallow and well drained. It formed in colluvium and residuum derived from interbedded limestone, sandstone, and shale. Typically the surface is 50 percent covered with gravel and cobbles. The surface layer is strong brown sandy loam 2 inches thick. The subsoil is strong brown and light brown gravelly sandy loam 10 inches thick. Weakly consolidated, interbedded sandstone, limestone, and shale is at a depth of 12 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Byrnie soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard

of water erosion is severe. The hazard of wind erosion is severe.

Rock outcrop consists of exposures of limestone, reddish sandstone, and shale.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Byrnie soil is mainly bluebunch wheatgrass, needleandthread, western wheatgrass, and true mountainmahogany. As the range condition deteriorates, threadleaf sedge and rabbitbrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 600 pounds of air-dry vegetation per acre in normal years. Production ranges from 800 pounds in favorable years to 350 pounds in unfavorable years. Areas of this soil near Iron Mountain have slightly higher production.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing.

Production of vegetation suitable for livestock grazing is limited by the droughtiness of the Byrnie soil, the low annual precipitation, and by the amount of Rock outcrop in the unit. This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Byrnie soil is in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. This unit is in the Rocky Hills, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch precipitation Southern Plains zone.

131—Calciborolls, 0 to 3 percent slopes.

This map unit is on stream terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is less than 85 to 110 days.

Included in this unit are small areas of Center Creek loam and Folavar very gravelly sandy loam. Also included are areas of similar soils with thinner surface layers. Included areas make up about 15 percent of the total acreage.

The Calciborolls soils are very deep and moderately well drained. They formed in alluvium. These soils are highly variable within short distances, and no single profile is typical. Commonly, the surface layer is brown loam or sandy loam 10 to 20 inches thick. The upper part of the subsoil is commonly very pale brown loam or clay loam 5 to 10 inches thick. The lower part is commonly white gravelly loam, gravelly clay loam, very gravelly loam, or very gravelly clay loam 15 to 30 inches thick. The substratum is commonly light yellowish brown very gravelly loam, very gravelly sandy loam, or very gravelly loamy sand to a depth of 60 inches or more.

Permeability of the Calciborolls soil is moderate to moderately rapid. Available water capacity is low or moderate. Effective rooting depth is 60 inches or more for plants that can tolerate a water table, but for others it is 36 to 60 inches. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table is at a depth of 3 to 5 feet from April through August.

This unit is used mainly for irrigated hay and pasture. It is also used as rangeland.

If this unit is used for irrigated hay and pasture, the main limitation is the alkalinity and the droughtiness of the soil. To avoid overirrigating, applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. overirrigating creates a more shallow water table and leaches plant nutrients. Frequent applications of irrigation water will be necessary because of the limited available water capacity of the soil. Fertilizer is needed for optimum growth of plants and should be applied according to soil tests.

The potential plant community on this unit is mainly alkali sacaton, basin wildrye, and alkali bluegrass. As the range condition deteriorates, inland saltgrass and greasewood increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 3,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 3,400 pounds in favorable years to 2,500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the wetness and alkalinity of the soil.

Some areas of this unit are moderately well suited for stockwater ponds. With proper site selection, pits dug sufficiently below the level of the water table can provide water for livestock during the period of the year when the

water table is at its highest level. In some areas, the pits or other types of ponds will not hold water above the level of the water table for a long period of time due to the seepage potential in the substatum of the soil. Because some areas of this unit are poorly suited for stockwater ponds, an onsite investigation should be conducted to determine the suitability of a site. This soil is poorly suited for mechanical range renovation and range seeding; the main limitation is the alkalinity of the soil. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the alkalinity of the soil.

This unit is in capability subclass IVe, nonirrigated and irrigated. It is in the Saline Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site.

132—Canburn loam, 1 to 4 percent slopes.

This very deep, poorly drained soil is on flood plains and stream terraces. It formed in alluvium. The native vegetation consists mainly of grasses. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Cantle loam in the Tie Siding and Red Butte areas, Dalecreek very fine sandy loam in areas of granite geological formations, and Wycolo sandy loam along the edges of the unit. Also included are very poorly drained soils in drainageways. Included areas make up about 20 percent of the total acreage.

Typically the surface layer is brown loam 23 inches thick. The next layer is brown loam 27 inches thick. The underlying material to a depth of 60 inches or more is light brown coarse sandy loam.

Permeability of the Canburn soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more for water-tolerant plants; but it is only 6 to 24 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table is at a depth of 6 to 24 inches from April through July. This soil is subject to frequent brief periods of flooding from April through June.

This unit is used mainly for hay and pasture. It is also used as rangeland and for wildlife habitat.

If this unit is used for hay and pasture, the main limitation is wetness. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Canburn soil is mainly basin wildrye, tufted hairgrass, and western wheatgrass. As the range condition deteriorates, sedges, rubber rabbitbrush, and willows increase. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 3,700 pounds of air-dry vegetation per acre in normal years. Production ranges from 4,300 pounds in favorable years to 3,000 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure. Production of vegetation suitable for livestock grazing is limited by the wetness of the soil.

This soil is well suited for stockwater ponds. Pits dug sufficiently below the level of the water table can provide water for livestock. This soil is moderately suited for mechanical range renovation and range seeding; the main limitation is wetness. Use of mechanical equipment on this soil is limited to the time of the year when the water table is the deepest. If range seedings are planned, plant species should be carefully selected because of the wetness of the soil.

This unit is in capability subclass Vw, nonirrigated and irrigated. It is in the Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this soil near Iron Mountain are in a similar range site in the 15- to 17-inch precipitation Southern Plains zone.

133—Cantle loam, 0 to 3 percent slopes.

This very deep, somewhat poorly drained soil is on flood plains and stream terraces. It formed in alluvium. The native vegetation consists mainly of grasses and grass-like plants. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Alogia loam on higher areas, Canburn loam, and Gerrard loam. Also included are small areas of Grenoble very gravelly sandy

loam in low-lying drainageways and Gypla silt loam near springs. Included areas make up about 20 percent of the total acreage.

Typically the surface layer is brown loam about 5 inches thick. The next layer is brown loam 22 inches thick. The underlying material is brown and reddish brown silty clay loam to a depth of 60 inches or more. All layers of this soil are slightly saline.

Permeability of the Cantle soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is only 6 to 24 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight. A seasonal high water table fluctuates between 0.5 and 2 feet from May through July. This soil is subject to frequent brief periods of flooding from April through July.

This unit is used mainly for irrigated hay and pasture. It is also used as rangeland and for wildlife habitat.

If this unit is used for hay and pasture, the main limitations are the wetness and the salinity of the soil. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Cantle soil is mainly alkali sacaton, basin wildrye, and alkali bluegrass. As the range condition deteriorates, inland saltgrass and greasewood increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 3,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 3,400 pounds in favorable years to 2,500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure. Production of vegetation suitable for livestock grazing is limited by the wetness and salinity of the soil.

This soil is well suited for stockwater ponds. Pits dug sufficiently below the level of the water table can provide water for livestock. This soil is moderately suited for mechanical range renovation and range seeding; the main limitations are wetness and salinity. Use of mechanical equipment on this soil is limited to the time of the year when the water table is the deepest. Mechanical range renovation may not be economically feasible due to the salinity of the soil. If range seedings are planned, plant species should be carefully selected because of the salinity and the wetness of the soil.

This unit is in capability subclass VIs, nonirrigated and irrigated. This unit is in the Saline Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this soil near Iron Mountain are in a similar range site in the 15- to 17-inch precipitation Southern Plains zone.

134—Carbol-Rock outcrop complex, 25 to 50 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 45 percent Carbol sandy loam and 45 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Amesmont fine sandy loam, Hapjack gravelly sandy loam, Kezar fine sandy loam, Rogert gravelly sandy loam, and a very shallow soil similar to the Carbol soil. Included areas make up about 10 percent of the total acreage.

The Carbol soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface layer is brown sandy loam 3 inches thick. The subsoil is brown sandy clay loam 7 inches thick. The substratum is yellowish brown very cobbly sandy clay loam 4 inches thick. Hard granite is at a depth of 14 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Carbol soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe. Winter winds remove the snow from the surface of this soil.

Rock outcrop consists of exposures of anorthositic granite.

This unit is used as rangeland, for wildlife habitat, and for recreation.

The potential plant community on this unit is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf

sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. The Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion.

Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soil. Due to the steepness of the slope, this unit is poorly suited for stockwater ponds, mechanical range renovation, or range seeding.

The Carbol soil is in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Carbol soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

135—Carmody-Edlin fine sandy loams, 15 to 45 percent slopes.

This map unit is on ridges and escarpments. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,500 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is 50 percent Carmody soil and 30 percent Edlin soil. The Carmody soil occurs on the shoulders of ridges and on escarpments. The Edlin soil occurs on back slopes and foot slopes of ridges and escarpments. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blackhall sandy loam, Rock River sandy loam, Ryan Park fine sandy loam, and Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Carmody soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from sandstone. Typically the surface is 20 percent covered with gravel and cobbles. The surface layer is yellowish brown fine sandy loam 1 inch thick. The upper part of the underlying material is yellowish brown and light yellowish brown very fine sandy loam 11 inches thick. The lower part is very pale brown fine sandy loam 12 inches thick. Weakly consolidated sandstone is at a depth of 24 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Carmody soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

The Edlin soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically the surface layer is brown fine sandy loam 3 inches thick. The upper part of the subsoil is brown and light yellowish brown fine sandy loam 20 inches thick. The lower part to a depth of 60 inches or more is pale yellow fine sandy loam and light yellowish brown sandy loam.

Permeability of the Edlin soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is severe. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly bluebunch wheatgrass, Indian ricegrass, mutton bluegrass, and needleandthread. As the range condition deteriorates, shorter species of grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion.

Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation. Due to the steepness of the slope, this unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding.

This unit is in capability subclass VIIe, nonirrigated. It is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

136—Carmody-Ryan Park fine sandy loams, 6 to 15 percent slopes.

This map unit is on hills and ridges. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,500 to 7,800 feet. The annual precipitation

is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is 40 percent Carmody soil and 40 percent Ryan Park soil. The Carmody soil occurs on the shoulders of the hills and ridges. The Ryan Park soil occurs on back slopes and toe slopes of the hills and ridges. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blackhall sandy loam, Edlin fine sandy loam, Rock River sandy loam, and Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Carmody soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from sandstone. Typically the surface layer is dark yellowish brown and brown fine sandy loam 5 inches thick. The underlying material is pale brown fine sandy loam 24 inches thick. Weakly consolidated sandstone is at a depth of 29 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Carmody soil is moderately rapid. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Ryan Park soil is very deep and well drained. It formed in alluvium derived dominantly from sandstone. Typically the surface layer is brown fine sandy loam 1 inch thick. The upper part of the subsoil is dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The lower part is pale brown fine sandy loam to a depth of 60 inches or more.

Permeability of the Ryan Park soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly needleandthread, thickspike wheatgrass, Indian ricegrass, silver sagebrush, and threadleaf sedge. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock in the Carmody soil and the potential for seepage losses. It is moderately well suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Areas tilled for seeding must remain narrow and at right angles to the wind. If practical, tillage should be along the contour of the slope to reduce the hazard of water erosion. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. It is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

137—Cathedral-Spinekop-Rock outcrop complex, 0 to 40 percent slopes.

This map unit is on mountains. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 12 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Cathedral gravelly sandy loam, 20 percent Spinekop sandy loam, and 20 percent Rock outcrop. The Cathedral soil occurs on mountain slopes with slopes of 20 to 40 percent. The Spinekop soil occurs in saddles and swales with slopes of 0 to 10 percent. The components of this unit are so intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Boyle gravelly sandy loam, Forelle sandy loam, and Dalecreek sandy loam. Included areas make up about 10 percent of the total acreage.

The Cathedral soil is shallow and well drained. It formed in colluvium and residuum derived from granite. Typically the surface is 40 percent covered with gravel. The surface layer is brown gravelly sandy loam 7 inches thick. The underlying material is brown very gravelly sandy loam 9 inches thick. Hard granite is at a depth of 16 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Cathedral soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Spinekop soil is very deep and well drained. It formed in alluvium. Typically the surface layer is grayish brown sandy loam 2 inches thick. The upper part of the subsoil is pale brown silty clay loam 29 inches thick. The lower part is brown very fine sandy loam to a depth of 60 inches or more.

Permeability of the Spinekop soil is moderately slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

Rock outcrop consists of exposures of highly weathered granite saprolite and nearly vertical hard granite blocks.

This unit is used mainly as rangeland, for wildlife habitat, and for recreation.

The potential plant community on the Cathedral soil is bluebunch wheatgrass, needleandthread, little bluestem, and blue grama. As the range condition deteriorates, threeawn, juniper, and blue grama increase. As the range condition further deteriorates, broom snakeweed, cheatgrass, and annual forbs invade. The potential plant community produces about 600 pounds of air-dry vegetation per acre in normal years. Production ranges from 900 pounds in favorable years to 300 pounds in unfavorable years.

The potential plant community on the Spinekop soil is mainly western wheatgrass, needleandthread, and blue grama. As the ecological condition deteriorates, blue grama and threadleaf sedge increase. As the ecological condition further deteriorates, broom snakeweed and cheatgrass invade. The potential plant community produces about 1,300 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,800 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the droughtiness of the Cathedral soil.

The Cathedral soil is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope. The Spinekop soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. It is moderately well suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of the Spinekop soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

The Cathedral soil is in capability subclass VIIe, nonirrigated. The Spinekop soil is in capability subclass IVe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Cathedral soil is in the Very Shallow, 12- to 14-inch precipitation, Southern Plains range site and the Spinekop soil is in the Loamy, 12- to 14-inch precipitation, Southern Plains range site. Areas of this map unit at the higher elevations are in similar range sites in the 15- to 19-inch precipitation Foothills and Mountains, Southeast zone.

138—Center Creek loam, 0 to 3 percent slopes.

This very deep, somewhat poorly drained soil is on low stream terraces adjacent to major streams. It formed in alluvium. The native vegetation consists mainly of grasses and sedges. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Gerrard loam, Redrob loam, and a soil similar to the Center Creek soil but which has sand and gravel at a depth of 20 to 32 inches. Included areas make up about 25 percent of the total acreage.

Typically the surface layer is dark grayish brown loam 3 inches thick. The upper part of the subsoil is dark grayish brown and brown clay loam 27 inches thick. The lower part is brown loam 7 inches thick. The substratum is yellowish brown very gravelly sandy loam to a depth of 60 inches or more.

Permeability of the Center Creek soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more for plants that can tolerate a water table, but it is 24 to 48 inches for plants that cannot. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal water table is at a depth of 2 to 4 feet from April through August. This soil is subject to a rare hazard of flooding.

This unit is used mainly for irrigated hay and pasture. It is also used as rangeland.

This unit is well suited for hay and pasture. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on this unit is mainly basin wildrye, tufted hairgrass, and western wheatgrass. As the range condition deteriorates, sedges and rabbitbrush increase. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 3,700 pounds of air-dry vegetation per acre in normal years. Production ranges from 4,300 pounds in favorable years to 3,000 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

This soil is well suited to the production of vegetation suitable for livestock grazing. The wetness of the soil, however, influences the composition of the plant community. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure.

This soil is moderately well suited for stockwater ponds. Pits dug sufficiently below the level of the water table can provide water for livestock during the time of the year when the water table is at its highest level. Because of the seepage potential of the substratum of the soil, pits or other types of ponds will not hold water above the level of the water table for long periods of time.

This soil is moderately well suited for mechanical range renovation and range seeding; the main limitation is wetness. Use of mechanical equipment on this soil is limited to the time of the year when the water table is the deepest. If range seedings are planned, plant species should be carefully selected because of the wetness of the soil.

This unit is in capability subclass IVw, nonirrigated and irrigated. It is in the Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site.

139—Chaperton, moderately saline-Blazon complex, 8 to 20 percent slopes.

This map unit is on ridges. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Chaperton loam, moderately saline, and 40 percent Blazon clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Delphill clay loam, Diamondville fine sandy loam, Forelle loam, and Poposhia loam. Also included are areas of Rock outcrop and reddish soils similar to the Chaperton and Blazon soils. Included areas make up about 15 percent of the total acreage.

The Chaperton soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from shale. Typically the surface is 25 percent covered with about 20 percent igneous gravel and 5 percent cobbles. The surface layer is yellowish brown loam about 4 inches thick. The subsoil is yellowish brown loam about 12 inches thick. The substratum is slightly saline, yellowish brown loam about 19 inches thick. Weakly consolidated shale is at a depth of 35 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Chaperton soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Blazon soil is shallow and well drained. It formed in colluvium and residuum derived dominantly from shale. Typically 30 percent of the surface is covered with gravel and cobbles. The surface layer is light brownish gray clay loam 2 inches thick. The subsoil is light brownish gray clay loam 5 inches thick. The substratum is light yellowish brown clay loam 9 inches thick. Weakly consolidated gypsiferous shale is at a depth of 16 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Blazon soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Chaperton soil is mainly western wheatgrass, bluebunch wheatgrass, needleandthread, gardner saltbush, birdfoot sagebrush, and big sagebrush. As the range condition deteriorates, blue grama, sagebrush, and saltbush increase. As the range condition further deteriorates, foxtail barley and

annual grasses and weeds invade. The potential plant community produces about 700 pounds of air-dry vegetation per acre in normal years. Production ranges from 900 pounds in favorable years to 500 pounds in unfavorable years.

The potential plant community on the Blazon soil is mainly western wheatgrass, bluebunch wheatgrass, bottlebrush squirreltail, mutton bluegrass, and winterfat. As the range condition deteriorates, shorter grasses and sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 800 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,000 pounds in favorable years to 500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation, the salinity of the Chaperton soil, and by the droughtiness of the Blazon soil.

This unit is poorly suited for stockwater ponds due to the steepness of slope and the depth to bedrock. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the hazard of water erosion, salinity of the Chaperton soil, and the droughtiness of the Blazon soil.

The Chaperton soil is in capability subclass VIe, nonirrigated. The Blazon soil is in capability subclass VIIe, nonirrigated. The Chaperton soil is in the Saline Loamy, 10- to 14-inch precipitation, High Plains Southeast range site and the Blazon soil is in the Shallow Clayey, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Platte County and Highway 34 are in similar range sites in the 12- to 14-inch precipitation Southern Plains zone.

140—Chaperton-Poposhia complex, 3 to 30 percent slopes.

This map unit is on ridges. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Chaperton cobbly sandy loam and 30 percent Poposhia very cobbly sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blazon loam, Diamonkit sandy loam, Luhon loam, and Stunner sandy loam. Also included are small areas of Browtine very gravelly fine sandy loam. Included areas make up about 20 percent of the total acreage.

The Chaperton soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from interbedded sandstone and shale. Typically the surface is 35 percent covered with cobbles and gravel. The surface layer is brown cobbly sandy loam 1 inch thick. The upper part of the subsoil is yellowish brown clay loam 9 inches thick. The lower part is light gray clay loam 18 inches thick. Weakly consolidated shale is at a depth of 28 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Chaperton soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is severe. The hazard of wind erosion is slight.

The Poposhia soil is very deep and well drained. It formed in alluvium. Typically the surface is 40 percent covered with 15 percent cobbles and 25 percent gravel. The surface layer is yellowish brown very cobbly sandy loam 1 inch thick. The upper part of the subsoil is pale brown loam 6 inches thick. The lower part is pale brown clay loam and yellowish brown sandy clay loam 27 inches thick. The substratum is light yellowish brown clay loam to a depth of 60 inches or more.

Permeability of the Poposhia soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is severe. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly bluebunch wheatgrass, western wheatgrass, needleandthread, black sagebrush, and mutton bluegrass. As the range condition deteriorates, prairie junegrass and big sagebrush increase. As the range condition further deteriorates, annual forbs or grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock

grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock in the Chaperton soil and the steepness of slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the cobbly surface layer of the Chaperton soil and the hazard of water erosion.

This unit is in capability subclass VIe, nonirrigated. It is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. Included are small areas of the Gravelly, 10- to 14-inch precipitation, High Plains Southeast range site.

141—Cheadle-Passcreek, cobbly subsoil-Rock outcrop complex, 5 to 25 percent slopes.

This map unit is on cuesta dip slopes and canyon sides. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 35 percent Cheadle cobbly very fine sandy loam; 25 percent Passcreek fine sandy loam, cobbly subsoil; and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Cheadle sandy loam, Miracle fine sandy loam, Nathale gravelly fine sandy loam, and Rimton very fine sandy loam. Included areas make up about 20 percent of the total acreage.

The Cheadle soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from limestone. Typically the surface layer is brown cobbly very fine sandy loam 3 inches thick. The upper 4 inches of the subsoil are dark brown very cobbly very fine sandy loam. The lower 3 inches are brown very cobbly sandy loam. Hard limestone is at a depth of 10 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Cheadle soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is severe. The hazard of wind erosion is moderate. Winter winds remove the snow from the surface of this soil.

The Passcreek soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from limestone. Typically the surface layer is brown fine sandy loam 4 inches thick. The upper part of the subsoil is brown sandy clay loam 7 inches thick. The lower part is brown and light yellowish brown very cobbly fine sandy loam 11 inches thick. Hard limestone is at a depth of 22 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Passcreek soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is severe. The hazard of wind erosion is severe. Winter winds remove the snow from the surface of this soil.

Rock outcrop consists of exposures of limestone and of interbedded lenses of sandstone.

This unit is used as rangeland and for wildlife habitat. It is also used for recreation.

The potential plant community on the Cheadle soil is mainly true mountainmahogany, bluebunch wheatgrass, needleandthread, antelope bitterbrush, and spike fescue. As the range condition deteriorates, threadleaf sedge and juniper increase. As the range condition further deteriorates, broom snakeweed, cactus, grasses, and forbs invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,150 pounds in favorable years to 550 pounds in unfavorable years.

The potential plant community on the Passcreek soil is mainly bluebunch wheatgrass, prairie junegrass, sagebrush, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing on the Cheadle soil is limited by the droughtiness of the soil. The Passcreek soil is well suited to the production.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the steepness of slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the hazard of water erosion, the cobbly surface layer and droughtiness of the Cheadle soil, and the presence of Rock outcrop.

The Cheadle soil is in capability subclass VIIe, nonirrigated. The Passcreek soil is in capability subclass VIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Cheadle soil is in the Rocky Hills, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site; and the Passcreek, cobbly subsoil soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

142—Cheadle-Rock outcrop-Miracle complex, 5 to 40 percent slopes.

This map unit is on ridges and cuesta escarpments. The native vegetation consists mainly of grasses, shrubs, and a few scattered trees. Elevation is 7,700 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 40 percent Cheadle sandy loam, 25 percent Rock outcrop, and 20 percent Miracle fine sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Passcreek fine sandy loam, cobbly subsoil. Also included is a soil similar to the Miracle soil, but with bedrock deeper than 60 inches. Included areas make up about 15 percent of the total acreage.

The Cheadle soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from sandstone and limestone. Typically the surface layer is brown sandy loam 4 inches thick. The subsoil is brown very cobbly sandy loam 6 inches thick. Hard reddish sandstone is at a depth of 10 inches. Depth to bedrock ranges from 10 to 20 inches. This soil is outside the characteristics of the Cheadle series because it does not have a horizon which contains an accumulation of calcium carbonate. This difference, however, does not significantly affect the use or management of this soil.

Permeability of the Cheadle soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe. Winter winds remove the snow from the surface of this soil.

Rock outcrop consists of exposures of reddish sandstone and interbedded limestone.

The Miracle soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from reddish sandstone and limestone. Typically the surface layer is dark reddish gray and reddish brown fine sandy loam 12 inches thick. The upper part of the subsoil is reddish brown sandy clay loam 12 inches thick. The lower part is reddish brown sandy loam 14 inches thick. Hard sandstone is at a depth of 38 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Miracle soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe. Winter winds remove the snow from the surface of this soil.

This unit is used as rangeland, for wildlife habitat, and for recreation.

The potential plant community on the Cheadle soil is mainly bluebunch wheatgrass, threetip sagebrush, black sagebrush, and Parry danthonia. As the range condition deteriorates, Sandberg bluegrass, prairie junegrass, and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Miracle soil is mainly bluebunch wheatgrass, Griffith wheatgrass, prairie junegrass, big sagebrush, threetip sagebrush, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing on the Cheadle soil is limited by the droughtiness of the soil. The Miracle soil is well suited to the production.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the steepness of slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the hazard of water erosion, the droughtiness of the Cheadle soil, and the presence of Rock outcrop.

The Cheadle and Miracle soils are in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Cheadle soil is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site; the Miracle soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

143—Cryaquolls, 1 to 9 percent slopes.

This map unit is in drainageways of foothills near the Medicine Bow Range. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 9,200 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

Included in this unit are small areas of Granile gravelly sandy loam, Hanson gravelly sandy loam, and Leavitt sandy loam. Also included are small areas of Cryoborolls soils. Included areas make up about 30 percent of the total acreage.

The Cryaquolls soil is very deep and poorly drained. It formed in alluvium. These soils are highly variable within short distances; no single profile is typical. Commonly, the surface is covered with a very dark grayish brown organic mat 3 to 6 inches thick. The surface layer is commonly dark gray loam or gray gravelly loam 10 to 30 inches thick. The next layer is commonly light olive gray or light brownish gray sandy loam, sandy clay loam, or clay loam and may be cobbly, very cobbly, or very stony. This layer is 10 to 20 inches thick. The underlying material is commonly light gray very cobbly sandy loam or extremely gravelly loamy sand to a depth of 60 inches or more. Some pedons have sand and gravel above 40 inches.

Permeability of the Cryaquolls soil is moderate to moderately rapid. Available water capacity is moderate to high. Effective rooting depth is 60 inches or more for plants that can tolerate a water table, but it is 5 to 18 inches for plants that cannot. Runoff is slow and the hazard of water erosion is slight. A seasonal high water table is at a depth of 0 and 1.5 feet from March through August. These soils are subject to frequent, brief seasonal and flash flooding.

This unit is used mainly as rangeland. It is also used for wildlife habitat.

The potential plant community on this soil is mainly tufted hairgrass, Nebraska sedge, slough sedge, and willows. As the range condition deteriorates, willows, sedges, and arrowgrass increase. As the range condition further deteriorates, annuals invade. The potential plant community produces about 5,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 6,500 pounds in favorable years to 4,000 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure.

This soil is well suited for stockwater ponds. Pits dug sufficiently below the level of the water table can provide water for livestock. This soil is poorly suited for mechanical range renovation and range seeding; the main limitation is wetness. Use of mechanical equipment on this soil is limited to the time of the year when the water table is the deepest. If range seedings are planned, plant species should be carefully selected because of the wetness of the soil.

This unit is in capability subclass VIw, nonirrigated. It is in the Wetland, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

144—Cryoborolls, 6 to 30 percent slopes.

This map unit is in mountain and foothill valleys. The native vegetation consists mainly of aspen trees with a few conifers. Elevation is 7,400 to 8,200 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

Included in this unit are small areas of poorly drained soils and soils with thinner surface layers. Included areas make up about 15 percent of the total acreage.

The Cryoborolls soil is very deep, and well to somewhat poorly drained. It formed in alluvium. These soils are highly variable within short distances; no single profile is typical. Commonly, the surface is covered a layer of aspen leaves and twig litter. The upper part of the surface layer is commonly grayish brown to very dark gray sandy loam, loam, or clay loam 10 to 26 inches thick. The subsoil is commonly yellowish brown or pale brown sandy loam, loam, or clay loam to a depth of 60 inches or more.

Permeability of the Cryoborolls soil is moderate to moderately rapid. Available water capacity is moderate to high. Effective rooting depth and depth to the water table is commonly 60 inches or more, but may be as shallow as 30 inches in areas with impeded drainage. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly for wildlife habitat and for livestock grazing. A few small areas are used for forest wood products.

The present plant community is mainly aspen with an understory of elk sedge, low sedge, bluegrasses, Columbia needlegrass, currant, gooseberry, snowberry, creeping juniper, bedstraw, spike fescue, kinnikinnick, strawberry, violet, rose pussytoes, Richardson's geranium, Rocky Mountain maple, Woods rose, western yarrow, Oregongrape, heartleaf arnica, cinquefoil, larkspur, lupine, and big sagebrush.

This unit is well suited to the production of vegetation suitable for livestock grazing. The tree canopy cover,

however, influences the composition of the plant community.

Because of the variability of the soils within short distances and from area to area, an onsite investigation is necessary to determine the suitability for stockwater ponds.

This unit is moderately suited to the harvesting of aspen wood products. Production of aspen is about 20 to 30 cubic feet per acre per year. Harvesting of the trees is moderately limited because of the steepness of slope and seasonal wetness.

This unit is in capability subclass VIe, nonirrigated. It is in an aspen woodland site.

145—Cushool-Cutback complex, 2 to 10 percent slopes.

This map unit is on pediments to the Laramie Range. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Cushool sandy loam and 35 percent Cutback fine sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Bateson sandy clay loam, Forelle loam, Pinelli loam, and Rock River sandy loam. Included areas make up about 25 percent of the total acreage.

The Cushool soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from sedimentary rocks. Typically the surface layer is light brownish gray sandy loam 3 inches thick. The subsoil is pale brown and light brownish gray sandy clay loam 13 inches thick. The substratum is very pale brown gravelly sandy loam about 16 inches thick. Weakly consolidated sandstone is at a depth of 32 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Cushool soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Cutback soil is moderately deep and well drained. It formed in alluvium and residuum derived from conglomerate and tuff. Typically the surface is partly covered with some gravel and a few cobbles. The surface layer is pale brown fine sandy loam 1 inch thick. The upper part of the subsoil is yellowish brown sandy clay loam 6 inches thick. The next part is very pale brown clay loam 10 inches thick. The lower part is yellowish brown extremely gravelly sandy clay loam and light olive brown very gravelly sandy loam 14 inches thick. Weakly consolidated sandstone is at a depth of 31 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Cutback soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Cushool soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Cutback soil is mainly western wheatgrass, bluebunch wheatgrass, mutton bluegrass, needleandthread, and black sagebrush. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the seepage potential. It is moderately well suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Areas tilled for seeding must remain narrow and at right angles to the wind. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. The Cushool soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site and the Cutback soil is

in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

146—Cushool-Diamondville fine sandy loams, 0 to 3 percent slopes.

This map unit is on hill crests. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Cushool soil and 35 percent Diamondville soil. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Alcova sandy loam, Forelle loam, and Stunner fine sandy loam. Included areas make up about 20 percent of the total acreage.

The Cushool soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from sandstone. Typically the surface layer is grayish brown fine sandy loam 2 inches thick. The upper part of the subsoil is brown sandy clay loam 11 inches thick. The next 3 inches are yellowish brown sandy clay loam. The lower part is brown sandy loam 16 inches thick. Weakly consolidated sandstone is at a depth of 32 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Cushool soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Diamondville soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from interbedded shale and sandstone. Typically the surface layer is brown fine sandy loam 8 inches thick. The upper part of the subsoil is yellowish brown clay loam 12 inches thick. The lower part is light yellowish loam 18 inches thick. Weakly consolidated shale is at a depth of 38 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Diamondville soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush, rabbitbrush, and blue grama increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock. It is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Areas tilled for seeding must remain narrow and at right angles to the wind. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVs, nonirrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

147—Cutback-Pinelli complex, 1 to 25 percent slopes.

This map unit is on pediments to the Laramie Range. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Cutback gravelly sandy clay loam, 1 to 25 percent slopes and 30 percent Pinelli loam, 1 to 8 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Chalkville loam, Chalkhill sandy loam, and Rock River fine sandy loam. Included areas make up about 20 percent of the total acreage.

The Cutback soil is moderately deep and well drained. It formed in alluvium and in residuum derived dominantly from conglomerate and tuff. Typically the surface is 30 percent covered with fine and medium gravel. The surface layer is pale brown gravelly sandy clay loam 2 inches thick. The upper part of the subsoil is light brown sandy clay loam 8 inches thick. The next part is very pale brown

very gravelly sandy loam 10 inches thick. The lower part is white very gravelly loamy sand 13 inches thick. Weakly consolidated tuffaceous sandstone is at a depth of 37 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Cutback soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Pinelli soil is very deep and well drained. It formed in alluvium derived dominantly from sedimentary rock. Typically the surface layer is dark brown loam 2 inches thick. The upper part of the subsoil is brown clay loam 15 inches thick. The next part is white clay loam 25 inches thick. The lower part is light gray clay loam to a depth of 60 inches or more.

Permeability of the Pinelli soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Cutback soil is mainly western wheatgrass, bluebunch wheatgrass, needleandthread, mutton bluegrass, and black sagebrush. As the range condition deteriorates, blue grama, threadleaf sedge, and black sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Pinelli soil is mainly western wheatgrass, bluebunch wheatgrass, and big sagebrush. As the range condition deteriorates, big sagebrush increases. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

The Cutback soil is poorly suited for stockwater ponds due to the depth to bedrock and the slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the hazard of water erosion and the gravelly surface layer.

The Pinelli soil is moderately well suited for stockwater ponds, mechanical range renovation, and range seeding. The main limitation for stockwater ponds is the steepness of slope. The main limitation for mechanical range renovation and range seeding is the hazard of water erosion. The low annual precipitation should also be of concern when planning range seedings. To reduce the hazard of water erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Tillage should be along the contour of the slope. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

The Cutback is in capability subclass VIe, nonirrigated. The Pinelli soil is in capability subclass IVe, nonirrigated. The Cutback is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Pinelli soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

148—Dahlquist-Rawlins-Browtine complex, moist, 3 to 15 percent slopes.

This map unit is on fan terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 35 percent Dahlquist very gravelly sandy loam, 30 percent Rawlins sandy loam, and 20 percent Browtine very cobbly sandy loam. The Dahlquist and Rawlins soils are on slopes of 3 to 8 percent. The Browtine soil is on slopes of 6 to 15 percent. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Anchutz sandy loam, McFadden gravelly fine sandy loam, Rock River sandy loam, and Stunner sandy loam. Included areas make up about 15 percent of the total acreage.

The Dahlquist soil is very deep and well drained. It formed in alluvium. Typically the surface is 20 percent covered with coarse gravel and fine cobbles. The surface layer is light brownish gray very gravelly sandy loam 2 inches thick. The upper 13 inches of the subsoil are yellowish brown very cobbly sandy clay loam. The next 5 inches are brownish yellow very gravelly sandy clay loam.

The lower part is light yellowish brown very gravelly sandy loam to a depth of 60 inches or more.

Permeability of the Dahlquist soil is moderate in the upper part of the subsoil and rapid in the lower part. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is slight. The hazard of wind erosion is slight.

The Rawlins soil is very deep and well drained. It formed in alluvium. Typically the surface layer is brown sandy loam 2 inches thick. The upper part of the subsoil is yellowish brown sandy clay loam 7 inches thick. The next part is pale yellow very fine sandy loam 9 inches thick. The lower part is pale yellow and yellow fine sandy loam to a depth of 60 inches or more.

Permeability of the Rawlins soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Browtine soil is very deep and well drained. It formed in alluvium. Typically the surface is 20 percent covered with coarse gravel and fine cobbles. The surface layer is grayish brown very cobbly sandy loam 10 inches thick. The upper part of the subsoil is pale yellow very cobbly sandy loam 8 inches thick. The next part is light gray very cobbly sandy loam 14 inches thick. The lower part is pale yellow gravelly clay loam to a depth of 60 inches or more.

Permeability of the Browtine soil is moderately rapid in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. Effective rooting depth is 15 to 25 inches because carbonates restrict growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight.

This unit is used mainly as rangeland or for wildlife habitat. A few small areas are used for irrigated hay.

If this unit is used for hay and pasture, the main limitations are the cobbles on the surface and the droughtiness of the Dahlquist and Browtine soils; the steepness of slope is also a limitation. To avoid overirrigating and leaching of plant nutrients, applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. Frequent applications of irrigation water will be necessary because of the limited available water capacity of the soils. Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on this unit is mainly bluebunch wheatgrass, Idaho fescue, prairie junegrass, and western wheatgrass. As the range condition deteriorates, blue grama and sagebrush increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,300 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,700 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds due to the potential for seepage losses. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the gravel and cobbles in the surface layers of the Dahlquist and Browtine soils.

The Dahlquist and Browtine soils are in capability subclass VIs, nonirrigated and irrigated. The Rawlins soil is in capability subclass IVe, nonirrigated and irrigated. This unit is in the Coarse Upland, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

149—Dalecreek-Kovich complex, 0 to 9 percent slopes.

This map unit is on flood plains and in valleys of mountainous areas. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 55 percent Dalecreek sandy loam, 0 to 9 percent slopes, and 30 percent Kovich loam, 0 to 3 percent slopes. The Dalecreek soil is on the higher areas of the flood plains and valley bottoms. The Kovich soil is on the lower areas of the flood plains and valley bottoms. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Canburn loam and of Lininger loam. Also included are small areas of a very deep, well drained, very gravelly, loamy soil. Included areas make up about 15 percent of the total acreage.

The Dalecreek soil is very deep and moderately well drained. It formed in alluvium derived dominantly from granite. Typically the surface layer is dark grayish brown sandy loam 8 inches thick. The subsoil is very dark

grayish brown and gray loam 24 inches thick. The substratum to a depth of 60 inches or more is gray sandy clay loam stratified with thin lenses of loamy coarse sand.

Permeability of the Dalecreek soil is moderate. Available water capacity is high. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe. Effective rooting depth is 60 inches for water-tolerant plants, but it is only 30 to 48 inches for plants that cannot tolerate a water table. A seasonal high water table fluctuates between depths of 2.5 and 4 feet from April through July. This soil is subject to a rare hazard of flooding.

The Kovich soil is very deep and poorly drained. It formed in alluvium derived dominantly from granite. Typically the surface layer is dark brown loam 8 inches thick. The next 23 inches are very dark grayish brown loam. The underlying material, to a depth of 60 inches or more, is stratified grayish brown gravelly sandy clay loam, loam, sandy loam, and gravelly sand.

Permeability of the Kovich soil is moderate. Available water capacity is high. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is only 5 to 30 inches for plants that cannot tolerate a high water table. A seasonal high water table is at a depth of 0 to 3 feet from April through August. This soil is subject to brief, occasional flooding from April through July.

This unit is used for irrigated hay, as rangeland, and for wildlife habitat.

If this unit is used for hay and pasture, the main limitations are the short growing season and the wetness of the Kovich soil. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Dalecreek soil is mainly basin wildrye, tufted hairgrass, slender wheatgrass, and western wheatgrass. As the range condition deteriorates, low-growing sedges, shrubby cinquefoil, rubber rabbitbrush, and willows increase. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 4,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 4,500 pounds in favorable years to 3,300 pounds in unfavorable years.

The potential plant community on the Kovich soil is mainly tufted hairgrass, Nebraska sedge, slough sedge, and willows. As the range condition deteriorates, willows increase. As the range condition further deteriorates, rushes, sedges, and annual forbs invade. The potential plant community produces about 5,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 6,500 pounds in favorable years to 4,000 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community. The Dalecreek soil is well suited to the production of vegetation suitable for livestock grazing. Production of vegetation on the Kovich soil is limited by wetness. Grazing should be delayed until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure.

This unit is well suited for stockwater ponds. Pits dug sufficiently below the level of the water table can provide water for livestock. Because the water table is at a more shallow depth in the Kovich soil, it is better suited for these pits than the Dalecreek soil. The Kovich soil is poorly suited for mechanical range renovation and range seeding; the main limitation is wetness. Use of mechanical equipment on the Kovich soil is limited due to wetness. If range seedings are planned, plant species should be carefully selected because of the wetness of the soil.

The Dalecreek soil is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

The Dalecreek soil is in capability subclass IVw, irrigated and nonirrigated. The Kovich soil is in capability subclass Vw, irrigated and nonirrigated. The Dalecreek soil is in the Subirrigated, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Kovich soil is in the Wetland, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. Areas of this map unit near the Platte County line near Highway 34 are in the 12- to 14-inch precipitation, Southern Plains range site zone.

150—Delphill-Blazon complex, 3 to 20 percent slopes.

This map unit is on hills and ridges. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is 45 percent Delphill loam and 35 percent Blazon clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Chaperton loam, Diamondville fine sandy loam, and Poposhia loam. Also included are small areas of Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Delphill soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from shale and sandstone. Typically the surface layer is light yellowish brown loam 1 inch thick. The underlying material is yellowish brown and very pale brown clay loam 20 inches thick. Weakly consolidated shale is at a depth of 21 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Delphill soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Blazon soil is shallow and well drained. It formed in residuum and alluvium derived dominantly from shale and sandstone. Typically the surface layer is olive clay loam about 2 inches thick. The underlying material is olive clay loam 9 inches thick. Weakly consolidated shale is at a depth of 11 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Blazon soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Delphill soil is mainly western wheatgrass, needleandthread, bluebunch wheatgrass, and big sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. The Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Blazon soil is mainly bluebunch wheatgrass, western wheatgrass, mutton bluegrass, bottlebrush squirreltail, and winterfat. As the range condition deteriorates, Sandberg bluegrass and big sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 800 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,000 pounds in favorable years to 500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion.

Production of vegetation on the Delphill soil suitable for livestock grazing is moderately limited by the low annual precipitation. Production of vegetation on the Blazon soil is moderately limited by the droughtiness of the soil and by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the slope and the depth to bedrock. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the hazard of water erosion and the droughtiness of the Blazon soil. Tillage for range improvement is not recommended. Interseeding and seedbed preparation by band spraying of herbicides can be used. Mechanical range renovation may not be practical in some areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

The Delphill soil is in capability subclass VIe, nonirrigated. The Blazon soil is in capability subclass VIIe, nonirrigated. The Delphill soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Blazon soil is in the Shallow Clayey, 10- to 14-inch precipitation, High Plains Southeast range site.

151—Diamondville-Cushool complex, 3 to 15 percent slopes.

This map unit is on hills and ridges. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Diamondville fine sandy loam and 40 percent Cushool sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blazon loam, Forelle loam, and Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Diamondville soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from shale and sandstone. Typically the surface layer is pale brown fine sandy loam 6 inches thick. The upper 12 inches of the subsoil are pale brown loam. The next 4 inches are very pale brown loam. The lower part is very pale brown fine sandy loam 13 inches thick. Weakly consolidated interbedded sandstone and shale are at a depth of 35 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Diamondville soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Cushool soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from interbedded sandstone and shale. Typically the surface layer is pale brown sandy loam 3 inches thick. The upper part of the subsoil is light yellowish brown and very pale brown sandy clay loam about 12 inches thick. The lower part is very pale brown fine sandy loam 13 inches thick. Weakly consolidated sandstone is at a depth of 28 inches. Depth to bedrock ranges from 20 to 40 inches. In some areas, the lower part of the subsoil is gravelly.

Permeability of the Cushool soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Diamondville soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Cushool soil is mainly needleandthread, thickspike wheatgrass, and Indian ricegrass. As the range condition deteriorates, sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the slope. It is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazards of wind and water erosion. To reduce the hazards of wind and water erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Areas tilled for seeding must remain narrow and at right angles to the wind. If practical, tillage should be along the contour of the slope. Mechanical range renovation may not be practical in some areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. The Diamondville soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site and the Cushool soil is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch precipitation Southern Plains zone.

152—Diamonkit-Stylite sandy loams, 3 to 15 percent slopes.

This map unit is on hillslopes. The native vegetation consists mainly of grasses and some shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Diamonkit sandy loam, 3 to 15 percent slopes; and 35 percent Stylite sandy loam, 3 to 8 percent slopes. The components of this unit are so intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Forelle loam and Rock River sandy loam. Included areas make up about 25 percent of the total acreage.

The Diamonkit soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from interbedded gypsiferous sedimentary rock. Typically the surface layer is light yellowish brown sandy loam 1 inch thick. The upper part of the subsoil is yellowish brown and light yellowish brown sandy clay loam 10 inches thick. The lower part is light yellowish brown loam and grayish brown clay loam 22 inches thick; it contains common medium filaments, threads, and soft masses of gypsum. Weakly consolidated interbedded

gypsiferous shale and sandstone are at a depth of 33 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Diamonkit soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Stylite soil is very deep and well drained. It formed in alluvium and residuum derived dominantly from gypsiferous sedimentary rock. Typically the surface layer is light olive brown sandy loam 2 inches thick. The upper 12 inches of the subsoil are light brownish gray loam. The next 17 inches are light yellowish brown loam and contains a high amount of calcium carbonate. The lower part to a depth of 60 inches or more is light yellowish brown loam and contains many soft masses of gypsum.

Permeability of the Stylite soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used mainly as rangeland. It is also used for wildlife habitat.

The potential plant community on the Diamonkit soil is mainly bluebunch wheatgrass, western wheatgrass, mutton bluegrass, black sagebrush, and needleandthread. As the range condition deteriorates, bluegrasses, sagebrush, and sedges increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Stylite soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush, rabbitbrush, and blue grama increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The vegetative production and plant communities vary slightly in some areas. This is due to the variable amounts of gypsum and other salts in these soils.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing should be managed to protect the unit from excessive erosion.

Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the alkalinity of the Stylite soil.

This unit is poorly suited for stockwater ponds because of the depth to bedrock in the Diamonkit soil and the potential for seepage caused by piping.

This unit is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazards of wind and water erosion. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazards of wind and water erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. If practical, tillage should be along the contour of the slope. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This map unit is in capability subclass IVe, nonirrigated. The Diamonkit soil is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Stylite soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Platte County near Highway 34 are in similar range sites in the 12- to 14-inch precipitation Southern Plains zone.

153—Elkol clay loam, 0 to 8 percent slopes.

This soil is very deep and well drained. It formed in alluvium. This unit is on stream terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Gerdrum Family loam, Kiltabar silty clay loam, and Tisworth loam. Included areas make up about 15 percent of the total acreage.

Typically the surface layer is brown clay loam 3 inches thick. The upper 31 inches of the underlying material is light olive brown and light yellowish brown clay. The lower part to a depth of 60 inches or more is light olive brown clay loam. This soil is slightly saline and strongly alkaline in all layers.

Permeability of the Elkol soil is slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly western wheatgrass, Indian ricegrass, bottlebrush squirreltail, and gardner saltbush. As the range condition deteriorates, shrubs increase. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 500 pounds of air-dry vegetation per acre in normal years. Production ranges from 650 pounds in favorable years to 300 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the salinity and alkalinity of the soil.

This soil is well suited for stockwater ponds. It is poorly suited for mechanical range renovation and range seeding; the main limitation is the salinity and alkalinity of the soil. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity and alkalinity of the soil. The low annual precipitation should also be of concern when planning range seedings.

This unit is in capability subclass VIs, nonirrigated. It is in the Saline Upland, 10- to 14-inch precipitation, High Plains Southeast range site.

154—Elkol-Gerdrum Family complex, 1 to 8 percent slopes.

This map unit is on stream terraces and on hillslopes adjoining playa lakes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Elkol silty clay loam, 1 to 3 percent slopes and 25 percent Gerdrum Family loam, 3 to 8 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blazon loam, Diamondville fine sandy loam, Forelle loam, and Tisworth loam. Also included are areas of clay dunes. Included areas make up about 25 percent of the total acreage.

The Elkol soil is very deep and well drained. It formed in alluvium. Typically the surface layer is yellowish brown strongly alkaline silty clay loam 2 inches thick. The upper 28 inches of the underlying material is light olive brown and yellowish brown strongly alkaline silty clay loam. The lower part to a depth of 60 inches or more is light yellowish brown moderately alkaline sandy clay loam. This soil is slightly saline in all layers.

Permeability of the Elkol soil is slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Gerdrum Family soil is very deep and well drained. It formed in alluvium. Typically the surface layer is pale brown loam 1 inch thick. The upper 15 inches of the subsoil are light yellowish brown strongly alkaline silty clay loam. The next 15 inches are yellowish brown strongly alkaline silty clay loam. The lower part is light yellowish brown moderately alkaline silty clay loam to a depth of 60 inches or more. This soil is moderately saline in all layers below a depth of 16 inches.

Permeability of the Gerdrum Family soil is very slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Elkol soil is mainly alkali sacaton, basin wildrye, inland saltgrass, black greasewood, and western wheatgrass. As the range condition deteriorates, greasewood and inland saltgrass increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,800 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,500 pounds in favorable years to 1,200 pounds in unfavorable years.

The potential plant community on the Gerdrum Family soil is mainly western wheatgrass, Indian ricegrass, bottlebrush squirreltail, and gardner saltbush. As the range condition deteriorates, shrubs increase. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 500 pounds of air-dry vegetation per acre in normal years. Production ranges from 650 pounds in favorable years to 300 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the salinity and alkalinity of the soil.

This unit is well suited for stockwater ponds. It is poorly suited for mechanical range renovation and range seeding; the main limitation is the salinity and alkalinity of the soils. If range seedings are planned, seeding rates should be increased and plant species carefully selected

because of the salinity and alkalinity of the soils. The low annual precipitation should also be of concern when planning range seedings.

This unit is in capability subclass VIs, nonirrigated. The Elkol soil is in the Saline Lowland, 10- to 14-inch precipitation, High Plains Southeast range site. The Gerdrum Family soil is in the Saline Upland, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch precipitation Southern Plains zone.

155—Elkol-Gerdrum Family, overflow complex, 0 to 3 percent slopes.

This map unit is on stream terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Elkol silty clay loam and 35 percent Gerdrum Family loam, overflow. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Bosler sandy loam, Diamondville fine sandy loam, and Tisworth fine sandy loam. Also included are small areas of Borollic Camborthids soils. Included areas make up about 15 percent of the total acreage.

The Elkol soil is very deep and well drained. It formed in alluvium. Typically the surface layer is light olive brown strongly alkaline silty clay loam 5 inches thick. The upper 40 inches of the substratum is olive yellow and light yellowish brown strongly alkaline silty clay loam. The lower part to a depth of 60 inches or more is light olive brown strongly alkaline silty clay. This soil is slightly saline in all layers.

Permeability of the Elkol soil is slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

The Gerdrum Family soil is very deep and moderately well drained. It formed in alluvium. Typically the surface layer is pale brown loam 2 inches thick. The upper part of the subsoil is olive brown and light yellowish brown strongly alkaline silty clay loam 19 inches thick. The lower part is light yellowish brown strongly alkaline, moderately saline clay loam to a depth of 60 inches or more.

Permeability of the Gerdrum Family soil is very slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. From May through July, a high water table fluctuates between a depth of 4 and 6 feet.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly alkali sacaton, basin wildrye, inland saltgrass, black greasewood, and western wheatgrass. As the range condition deteriorates, greasewood and inland saltgrass increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,800 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,500 pounds in favorable years to 1,200 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation and by the salinity and alkalinity of the soil.

This unit is well suited for stockwater ponds. It is poorly suited for mechanical range renovation and range seeding; the main limitation is the salinity and alkalinity of the soils. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity and alkalinity of the soils. The low annual precipitation should also be of concern when planning range seedings.

This unit is in capability subclass VIs, nonirrigated. It is in the Saline Lowland, 10- to 14-inch precipitation, High Plains Southeast range site.

156—Evanston fine sandy loam, 0 to 6 percent slopes.

This very deep, well drained soil is on fan terraces and alluvial fans. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,500 to 6,800 feet. The annual precipitation is 15 to 17 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Forelle loam and Ipson gravelly loam. Included areas make up about 15 percent of the total acreage.

Typically the surface layer is grayish brown fine sandy loam 4 inches thick. The upper part of the subsoil is dark yellowish brown sandy clay loam and yellowish brown clay loam 10 inches thick. The lower part is light yellowish brown and very pale brown loam to a depth of 60 inches or more.

Permeability of the Evanston soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Evanston soil is mainly needleandthread, western wheatgrass, and little bluestem. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed and annual grasses invade. The potential plant community produces about 1,400 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,900 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. This soil is well suited to the production of vegetation suitable for livestock grazing.

This soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. It is well suited for mechanical range renovation and range seeding.

This unit is in capability subclass IVe, nonirrigated. It is in the Loamy, 15- to 17-inch precipitation, Southern Plains range site.

157—Evanston-Bonjea complex, 5 to 40 percent slopes.

This map unit is on foothills and on mountain slopes. The native vegetation consists mainly of grasses, shrubs, and a few trees. Elevation is 6,300 to 7,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Evanston loam, 5 to 30 percent slopes and 30 percent Bonjea fine sandy loam, 10 to 40 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Spinekop loam and granitic Rock outcrop. Also included are small areas of a soil similar to the Bonjea soil, but with a sandy loam subsoil; and areas of soil similar to the Evanston soil, but with a thicker surface layer. Included areas make up about 25 percent of the total acreage.

The Evanston soil is very deep and well drained. It formed in alluvium and eolian deposits derived dominantly from tuffaceous sedimentary rock. Typically the surface layer is dark brown loam 7 inches thick. The upper part of the subsoil is brown loam 13 inches thick. The lower part is light brownish gray loam to a depth of 60 inches or more.

Permeability of the Evanston soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Bonjea soil is shallow and well drained. It formed in residuum and colluvium derived from granite and gneiss. The surface layer is very dark grayish brown fine sandy loam 5 inches thick. The subsoil is is yellowish brown gravelly sandy clay loam 10 inches thick. Hard granite is at a depth of 15 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Bonjea soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Evanston soil is mainly bluebunch wheatgrass, prairie junegrass, Griffith wheatgrass, big sagebrush, threetip sagebrush, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Bonjea soil is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion.

The Evanston soil is well suited to the production of vegetation suitable for livestock grazing. Production on the Bonjea soil is moderately limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Evanston soil is in capability subclass VIe, nonirrigated. The Bonjea soil is in capability subclass VIIe, nonirrigated. The Evanston soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Bonjea soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

158—Fiveoh-Fiveoh, cobbly substratum-Ryan Park complex, 1 to 8 percent slopes.

This map unit is on alluvial fans and terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 30 percent Fiveoh sandy loam; 30 percent Fiveoh sandy loam, cobbly substratum; and 25 percent Ryan Park fine sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Canwall fine sandy loam and Pilotpeak cobbly fine sandy loam. Also included are small areas of sand and gravel bars along drainageways. Included areas make up about 15 percent of the total acreage.

The Fiveoh soil is very deep and well drained. It formed in alluvium derived from limestone and sandstone. Typically the surface layer is yellowish brown sandy loam 6 inches thick. The upper part of the subsoil is brown fine sandy loam 10 inches thick. The lower part is light brown and strong brown fine sandy loam to a depth of 60 inches or more.

Permeability of the Fiveoh soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe. The soil is subject to gullying during heavy rainstorms.

The Fiveoh, cobbly substratum soil is very deep and well drained. It formed in alluvium. Typically the surface layer is brown sandy loam 3 inches thick. The upper part of the subsoil is brown sandy loam 19 inches thick. The next 9 inches are strong brown cobbly sandy loam. The lower part to a depth of 60 inches or more is strong brown very cobbly sandy loam.

Permeability of the Fiveoh, cobbly substratum soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Ryan Park soil is very deep and well drained. It formed in alluvium. Typically the surface layer is yellowish brown fine sandy loam 3 inches thick. The upper part of the subsoil is brown fine sandy loam 15 inches thick. The lower part is brown gravelly fine sandy loam and light brown gravelly sandy loam to a depth of 60 inches or more.

Permeability of the Ryan Park soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly needleandthread, thickspike wheatgrass, Indian ricegrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. It is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

159—Fiveoh, cobbly substratum-Fiveoh-Urban land complex, 1 to 5 percent slopes.

This map unit is on terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Fiveoh sandy loam, cobbly substratum; 20 percent Fiveoh sandy loam; and 15 percent Urban land. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Almy loam, Rohonda fine sandy loam, and Wycolo sandy loam. Included areas make up about 15 percent of the total acreage.

The Fiveoh, cobbly substratum soil is a very deep and well drained. It formed in alluvium. Typically the surface layer is brown fine sandy loam 3 inches thick. The upper 15 inches of the subsoil are strong brown fine sandy loam. The next 11 inches are light brown gravelly fine sandy loam. The lower part to a depth of 41 inches are reddish yellow fine sandy loam. The substratum is reddish yellow very cobbly sandy loam to a depth of 60 inches or more.

Permeability of the Fiveoh, cobbly substratum soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Fiveoh soil is a very deep and well drained. It formed in alluvium derived from limestone and sandstone. Typically the surface layer is yellowish brown sandy loam 6 inches thick. The upper part of the subsoil is brown fine sandy loam 10 inches thick. The lower part is light brown and strong brown fine sandy loam to a depth of 60 inches or more.

Permeability of the Fiveoh soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe. The soil is subject to gullying during heavy rain storms.

Urban land is covered with buildings, streets, and parking lots. The original soil is either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Red fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

This unit is well suited to urban development. It has few limitations.

The Fiveoh soils are in capability subclass IVe, nonirrigated.

160—Fiveoh, cobbly substratum-Joemre fine sandy loams, 1 to 5 percent slopes.

This map unit is on terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 60 percent Fiveoh, cobbly substratum, 1 to 3 percent slopes and 25 percent Joemre fine sandy loam, 2 to 5 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Almy loam, Fiveoh sandy loam, Rohonda fine sandy loam, and Wycolo sandy loam. Included areas make up about 15 percent of the total acreage.

The Fiveoh, cobbly substratum soil is very deep and well drained. It formed in alluvium. Typically the surface layer is brown fine sandy loam 3 inches thick. The upper 15 inches of the subsoil are strong brown fine sandy loam. The next 11 inches are light brown gravelly fine sandy loam. The lower part to a depth of 41 inches are reddish yellow fine sandy loam. The lower part is reddish yellow very cobbly sandy loam to a depth of 60 inches or more.

Permeability of the Fiveoh, cobbly substratum soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Joemre soil is very deep and well drained. It formed in alluvium. Typically the surface layer is brown fine sandy loam 4 inches thick. The upper 14 inches of the subsoil are strong brown fine sandy loam. The next part is yellowish red loam 7 inches thick. The lower part is yellowish red loam to a depth of 60 inches or more.

Permeability of the Joemre soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the unit is mainly needleandthread, Indian ricegrass, thickspike wheatgrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years. Areas of this unit near Iron Mountain have a slightly higher production.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Areas tilled for seeding must remain narrow and at right angles to the wind. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. It is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

161—Folavar very gravelly sandy loam, 0 to 3 percent slopes.

This very deep, somewhat poorly drained soil is on terraces. It formed in alluvium and was modified by congeliturbation. The native vegetation consists mainly of grasses and sedges. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Gerrard loam and Pahlow gravelly sandy loam. Included areas make up about 25 percent of the total acreage.

Typically the surface is covered with a dense sod layer about 2 inches thick. The surface layer is brown very gravelly sandy loam 3 inches thick. The subsoil is dark yellowish brown very gravelly sandy loam 8 inches thick. The substratum is brown very gravelly loamy sand and extremely gravelly loamy sand to a depth of 60 inches or more.

Permeability of the Folavar soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is very low. Effective rooting depth is 60 inches or more for plants that can tolerate a water table, but it is 5 to 24 inches for plants that cannot. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight. A fluctuating water table between a depth of 0 and 2 feet occurs from April through August. The water table is the result of irrigation. This soil is subject to a rare hazard of flooding.

This unit is used mainly for irrigated hay and pasture and for wildlife habitat.

If this unit is used for hay and pasture, the main limitation is the wetness of the soil. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

This unit is in capability subclass VIs, nonirrigated and irrigated.

162—Folavar-Borollic Camborthids complex, 0 to 3 percent slopes.

This map unit is on stream terraces with a mound-intermound pattern of microrelief. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Folavar very gravelly sandy loam and 40 percent Borollic Camborthids soil. The Folavar soil occurs in intermound areas and the Borollic Camborthids soil occurs on the mounds. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Pahlow gravelly sandy loam. Also included are small areas of poorly drained soils. Included areas make up about 15 percent of the total acreage.

The Folavar soil is very deep and somewhat poorly drained. It formed in alluvium. Typically the surface is covered with a layer of dense sod 2 inches thick. The surface layer is brown very gravelly sandy loam 5 inches thick. The subsoil is dark yellowish brown gravelly sandy loam 7 inches thick. The substratum is yellowish brown very gravelly loamy sand and extremely gravelly loamy sand to a depth of 60 inches or more.

Permeability of the Folavar soil is moderately rapid in the subsoil and rapid in the substratum. Available water capacity is very low. Effective rooting depth is 60 inches or more for plants that can tolerate a water table, but it is 5 to 24 inches for plants that cannot. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight. A fluctuating water table at a depth of 0 and 2 feet occurs from April through August. The water

table is the result of irrigation of this soil. This soil is subject to a rare hazard of flooding.

The Borollic Camborthids soil is very deep and moderately well drained. It formed in alluvium. These soils vary from area to area, and no single profile is typical. Commonly, the surface is about 20 percent covered with gravel. The surface layer is commonly brown gravelly sandy loam or very gravelly sandy loam 5 inches thick. The subsoil is commonly yellowish brown or brown very gravelly sandy loam 35 inches thick. The substratum is commonly pale brown very gravelly loamy sand or extremely gravelly loamy sand to a depth of 60 inches or more.

Permeability of the Borollic Camborthids soil is moderately rapid. Available water capacity is very low or low. Effective rooting depth is 60 or more inches. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight. A fluctuating water table is at a depth of 1.5 to 5 feet occurs during the growing season. It is due to irrigation of this soil. This soil is subject to a rare hazard of flooding.

This unit is used mainly for irrigated hay and pasture. It is also used for wildlife habitat.

If this unit is used for hay and pasture, the main limitation are the wetness of the soils and the hummocky terrain. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

This unit is in capability subclass VIs, nonirrigated and irrigated.

163—Forelle loam, 0 to 6 percent slopes.

This very deep, well drained soil is on fan aprons. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Cushool sandy loam, Diamondville fine sandy loam, Pinelli clay loam, and Stunner sandy loam. Also included in drainageways are areas of a soil similar to the Forelle soil, but which receive water from runoff. Included areas make up about 25 percent of the total acreage.

Typically the surface layer is very pale brown loam 2 inches thick. The upper part of the subsoil is yellowish brown clay loam 20 inches thick. The next 14 inches are light brownish gray loam. The lower part to a depth of 60 inches or more is pale brown sandy loam. In some areas, the surface layer and upper part of the subsoil are slightly darker in color.

Permeability of the Forelle soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Forelle soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is well suited for mechanical range renovation and range seeding. The low annual precipitation, however, should be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. This unit is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

164—Forelle-Urban land complex, 0 to 3 percent slopes.

This map unit is on terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 60 percent Forelle loam and 25 percent Urban land. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Diamondville fine sandy loam and Stunner sandy loam. Also included in this unit are areas that have a seasonal high water table due to irrigation. Included areas make up about 15 percent of the total acreage.

The Forelle soil is very deep and well drained. It formed in alluvium. Typically the surface layer is brown loam 5 inches thick. The upper part of the subsoil is yellowish brown clay loam 19 inches thick. The next 11 inches are light brownish gray loam. The lower part to a depth of 60 inches or more is pale brown sandy loam.

Permeability of the Forelle soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

Urban land is covered with buildings, streets, and parking lots. The original soil is either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Red fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

The Forelle soil is well suited for urban development. It has few limitations.

The Forelle soil is in capability subclass IVc, nonirrigated.

165—Forelle-Diamondville association, 3 to 15 percent slopes.

This map unit is on hills. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Forelle fine sandy loam, 3 to 8 percent slopes and 35 percent Diamondville fine sandy loam, 6 to 15 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blazon loam, Chaperton cobbly sandy loam, Cushool sandy loam, Pinelli clay loam, and Tisworth sandy clay loam. Included areas make up about 20 percent of the total acreage.

The Forelle soil is very deep and well drained. It formed in alluvium. Typically the surface layer is light brownish gray fine sandy loam 4 inches thick. The upper 3 inches of the subsoil are brown loam. The next 8 inches are brown clay loam. The lower part is light yellowish brown and pale brown loam to a depth of 60 inches or more.

Permeability of the Forelle soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Diamondville soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from interbedded shale and sandstone. Typically the surface layer is brown fine sandy loam 1 inch thick. The upper part of the subsoil is yellowish brown loam 16 inches thick. The lower part is light yellowish brown and pale brown loam 17 inches thick. Weakly consolidated sandstone is at a depth of 34 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Diamondville soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

The Forelle soil is poorly suited for stockwater ponds due to the potential for seepage losses. The Diamondville soil is poorly suited for stockwater ponds due to the depth to bedrock. This unit is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazards of water and wind erosion. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. If practical, tillage should be along the contour of the slope. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be

needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch precipitation Southern Plains zone. Areas of this map unit near Platte County near Highway 34 are in similar range sites the 12- to 14-inch precipitation Southern Plains zone.

166—Glendive-Redrob-Grenoble complex, 0 to 3 percent slopes.

This map unit is on flood plains and low stream terraces. The native vegetation consists mainly of grasses, grass-like plants, willows, and cottonwoods. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Glendive loam, 35 percent Redrob loam, and 15 percent Grenoble gravelly sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of frequently flooded Redrob loam and Riverwash. Also included are small areas of a soil similar to the Glendive soil, but which are loamy textured; and a soil similar to the Redrob soil, but which has a lighter colored surface layer. Included areas make up about 10 percent of the total acreage.

The Glendive soil is very deep and moderately well drained. It formed in alluvium. Typically the surface layer is dark grayish brown and brown loam 6 inches thick. The underlying material to a depth of 60 inches or more is brown and pale brown fine sandy loam stratified with thin layers of dark grayish brown sandy loam and yellowish brown loam.

Permeability of the Glendive soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more for plants that can tolerate a water table, but it is 36 to 60 inches for plants that cannot. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table fluctuates between a depth of 3 and 5 feet from April through August. This soil is subject to a rare hazard of flooding.

The Redrob soil is very deep and poorly drained. It formed in alluvium. Typically the upper part of the surface layer is dark gray and gray loam 9 inches thick. The upper part of the underlying material is light yellowish brown loam and grayish brown sandy loam 10 inches thick. The next part is light yellowish brown very gravelly loam 5 inches thick. The lower part is light yellowish brown extremely gravelly loamy sand to a depth of 60 inches or more.

Permeability of the Redrob soil is moderate in the upper part and very rapid in the lower part. Available water capacity is low. Effective rooting depth is 60 inches or more for water-tolerant plants, but is 12 to 24 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight. The water table fluctuates between a depth of 1 and 2 feet from April through August. This soil is subject to a rare hazard of flooding.

The Grenoble soil is very deep and somewhat poorly drained. It formed in alluvium. Typically the surface layer is brown gravelly sandy loam 9 inches thick. The underlying material is yellowish brown very gravelly sand to a depth of 60 inches or more.

Permeability of the Grenoble soil is very rapid. Available water capacity is very low. Effective rooting is 60 inches or more for plants that can tolerate a water table, but it is 24 to 42 inches for plants that cannot. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table fluctuates between depths of 2 to 3.5 feet from March through August. This soil is subject to frequent brief flooding from May through June.

This unit is used mainly as rangeland and for wildlife habitat. In some areas it is also used for hay and pasture.

The potential plant community on the Glendive and Redrob soils is mainly alkali sacaton, basin wildrye, and alkali bluegrass. As the range condition deteriorates, inland salt grass and greasewood increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 3,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 3,400 pounds in favorable years to 2,500 pounds in unfavorable years.

The potential plant community on the Grenoble soil is mainly alkali sacaton, basin wildrye, inland saltgrass, and western wheatgrass. As the range condition deteriorates, greasewood and inland saltgrass increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,800 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,500 pounds in favorable years to 1,200 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the wetness and salinity of the soils. Grazing

should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure.

This unit is well suited for stockwater ponds. Pits dug sufficiently below the level of the water table can provide water for livestock. The Redrob soil is more suitable for these pits because the water table is at a more shallow depth in this soil than in the other soils. Because of the seepage potential of the lower layers of all the soils in this unit, pits or other types of ponds will not hold water above the level of the water table for a long period of time. This unit is poorly suited for mechanical range renovation and range seeding; the main limitations are wetness and salinity of the soils, and the gravelly surface layer of the Grenoble soil. Use of equipment on this unit is limited to periods when the water table is the deepest. If range seedings are planned, plant species should be carefully selected because of the salinity and the wetness of the soils.

If this unit is used for hay and pasture, the main limitation is the wetness of the soils. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The Glendive and the Redrob soils are in capability subclass IVw, nonirrigated and irrigated. The Grenoble soil is in capability subclass VIs, nonirrigated and irrigated. The Glendive and Redrob soils are in the Saline Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site. The Grenoble soil is in the Saline Lowland, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch precipitation Southern Plains zone.

167—Grenoble-Gerrard complex, 0 to 3 percent slopes.

This map unit is on flood plains and low stream terraces. The native vegetation consists mainly of willows, forbs, grasses, and sedges. Elevation is 6,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Grenoble gravelly loamy sand, 1 to 3 percent slopes and 30 percent Gerrard loam, 0 to 2 percent slopes. The Grenoble soil is on gravel bar remnants. The Gerrard soil is in abandoned meandering stream channels. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Glendive sandy loam, frequently flooded Redrob loam, and Riverwash. Also included are soils with a 12- to 24-inch-thick peat layer overlying sand and gravel. Included areas make up about 30 percent of the total acreage.

The Grenoble soil is very deep and somewhat poorly drained. It formed in alluvium. Typically the surface is covered with a 1-inch-thick layer of twigs, leaves, and other organic material. The surface layer is brown gravelly loamy sand 9 inches thick. The underlying material is yellowish brown very gravelly sand to a depth of 60 inches or more.

Permeability of the Grenoble soil is very rapid. Available water capacity is very low. Effective rooting depth is 60 inches or more for plants that can tolerate a water table, but it is 24 to 42 inches for plants that cannot. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table fluctuates between depths of 2 to 3.5 feet from March through August. This soil is subject to frequent brief flooding from May through June.

The Gerrard soil is very deep and poorly drained. It formed in alluvium. Typically the surface is covered with a thin organic mat. The surface layer is dark gray and grayish brown loam 12 inches thick. The upper 12 inches of the underlying material are light brownish gray very gravelly loamy sand. The lower part is light gray very gravelly sand to a depth of 60 inches or more.

Permeability of the Gerrard soil is moderate in the surface layer and very rapid in the underlying material. Available water capacity is low. Effective rooting depth is 60 inches or more for plants that can tolerate a water table, but it is 5 to 18 inches for plants that cannot. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table fluctuates between the surface and a depth of 1.5 feet from March through August. This soil is subject to frequent brief flooding from May through June.

This unit is used mainly as rangeland and for wildlife habitat. A few areas are used for irrigated hay and pasture.

If this unit is used for hay and pasture, the main limitations are the wetness of the soils, flooding, and the gravelly surface layer of the Grenoble soil. Applications

of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of plants and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Grenoble soil is mainly basin wildrye, western wheatgrass, slender wheatgrass, and tufted hairgrass. As the range condition deteriorates, sedges and willows increase. As the range condition further deteriorates, bluegrass and annuals invade. The potential plant community produces about 3,700 pounds of air-dry vegetation per acre in normal years. Production ranges from 4,300 pounds in favorable years to 3,000 pounds in unfavorable years.

The potential plant community on the Gerrard soil is mainly Nebraska sedge, willows, and northern reedgrass. As the range condition deteriorates, willows increase. As the range condition further deteriorates, rushes, sedges, and annual forbs invade. The potential plant community produces about 5,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 6,000 pounds in favorable years to 3,500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the wetness of the soil. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to sustain grazing pressure.

This unit is well suited for stockwater ponds. Pits dug below the level of the water table can provide water for livestock. Because of the seepage potential of the soils, pit or other types of ponds will not hold water above the level of the water table for a long period of time. Because the water table is at a more shallow depth in the Gerrard soil, it is the most suitable soil for a pit.

This unit is poorly suited for mechanical range renovation and range seeding; the main limitations are the wetness of the Gerrard soil, and the gravelly surface layer and wind erosion hazard of the Grenoble soil. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. If range seedings are planned, plant species should be carefully selected because of the wetness of the Gerrard soil. Use of equipment is limited to the periods when of the water table is the deepest.

The Grenoble soil is in capability subclass VIs, irrigated and nonirrigated, and the Gerrard soil is in capability subclass VIw, nonirrigated and irrigated. The Grenoble soil is in the Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site. The Gerrard soil is in the Wetland, 10- to 14-inch precipitation, High Plains Southeast range site.

168—Greyback very cobbly sandy loam, 1 to 6 percent slopes.

This very deep, somewhat excessively drained soil is on outwash alluvial fans. It formed in glacial outwash derived from various sources. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 8,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

Included in this unit are small areas of Hanson gravelly sandy loam and Silas gravelly loam. Also included are small areas of poorly drained soils in swales. Included areas make up about 30 percent of the total acreage.

Typically the surface is 30 percent covered with about 20 percent cobbles and 10 percent stones. The surface layer is grayish brown and brown very cobbly sandy loam 9 inches thick. The upper part of the subsoil is pale brown very cobbly sandy loam 7 inches thick. The next 14 inches are brown very cobbly coarse sandy loam. The next part is brown very gravelly loamy coarse sand 6 inches thick. The lower part is pale brown very gravelly coarse sandy loam to a depth of 60 inches or more.

Permeability of the Greyback soil is rapid. Available water capacity is very low. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat. A few small areas are used for irrigated hay and pasture.

If this unit is used for irrigated hay and pasture, the main limitations are the cobbles and stones on the surface and the droughtiness of the soil. Frequent applications of irrigation water will be necessary because of the limited available water capacity of the soil. To avoid overirrigating and leaching of plant nutrients, applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. Fertilizer

is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Greyback soil is mainly bluebunch wheatgrass, Idaho fescue, western wheatgrass, and threetip sagebrush. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,300 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,700 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the droughtiness of the soil.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the very cobbly surface layer and the droughtiness of the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass VIs, nonirrigated and irrigated. It is in the Coarse Upland, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

169—Gypla loam, 0 to 3 percent slopes.

This very deep, somewhat poorly drained soil is on flood plains and in swales and sloughs. It formed in alluvium. The native vegetation consists mainly of grasses and grass-like plants. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period of 85 to 110 days.

Included in this unit are small areas of Alogia loam, Cantle loam, Kiltabar silty clay loam, and a moderately deep soil similar to the Gypla soil. Included areas make up about 30 percent of the total acreage.

Typically the surface layer is light yellowish brown loam 5 inches thick. The upper part of the subsoil is white silt loam 31 inches thick. The lower part is very pale brown gravelly silt loam to a depth of 60 inches or more. The subsoil contains a very high amount of gypsum and is moderately saline. In some areas, the surface layer is darker in color.

Permeability of the Gypla soil is moderate. Available water capacity is low. Effective rooting depth for most plants is 10 to 20 inches because the high contents of calcium carbonate, gypsum, and other salts restrict root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table fluctuates between 1.5 and 3.5 feet from April through July.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly basin wildrye, alkali bluegrass, and alkali sacaton. As the range condition deteriorates, inland saltgrass and greasewood increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 3,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 3,400 pounds in favorable years to 2,500 pounds in unfavorable years. In some areas, greasewood, basin wildrye, and western wheatgrass are the main plant community. These areas have about one-half the annual vegetation production of this unit.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the alkalinity of the soil. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure.

This soil is poorly suited for stockwater ponds. Although pits dug deeper than the level of the water table will create a source of water, the water may contain a high amount of undesirable salts. This soil is poorly suited for mechanical range renovation and range seeding; the main limitation is the salinity of the soil. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity of the soil.

This unit is in capability subclass VIIs, nonirrigated. It is in the Saline Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site.

170—Gypla-Urban land complex, 0 to 1 percent slope.

This map unit is on flood plains and in swales and sloughs. The native vegetation consists mainly of grasses and grass-like plants. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air

temperature is 40 to 48 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Gypla loam and 40 percent Urban land. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Alogia loam and a moderately deep soil similar to the Gypla soil. Included areas make up about 10 percent of the total acreage.

The Gypla soil is very deep and somewhat poorly drained. It formed in alluvium. Typically the surface layer is light yellowish brown loam 5 inches thick. The upper part of the subsoil is white silt loam 31 inches thick. The lower part is very pale brown gravelly silt loam to a depth of 60 inches or more. The subsoil contains a very high amount of gypsum and is moderately saline.

Permeability of the Gypla soil is moderate. Available water capacity is low. Effective rooting depth for most plants is 10 to 20 inches because the high contents of calcium carbonate, gypsum, and other salts restrict root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table fluctuates between 1.5 and 3.5 feet from April through July.

Urban land is covered with buildings, streets, and parking lots. The original soil has been either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Red fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

If the Gypla soil is used for urban development, the main limitations are the high corrosion potential of the soil to concrete and uncoated steel and the high water table. In addition, the growth of plants used for landscaping will be severely affected by the salinity of the Gypla soil. Use of this soil as a site for buildings with basements is not recommended due to the high water table. Septic tank absorption fields buried in the soil do not function properly due to the high water table. In addition, if several septic systems are installed in an area, the water added to the soil may raise the level of the water table.

The Gypla soil is in capability subclass VIIs, nonirrigated.

171—Hanson-Quander complex, 3 to 15 percent slopes.

This map unit is on outwash fan terraces. The native vegetation consists mainly of grasses, shrubs, and a few trees. Elevation is 7,800 to 8,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 50 percent Hanson gravelly sandy loam and 30 percent Quander gravelly loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Leavitt sandy clay loam. Also included are small areas of a soil similar to the Quander soil but which contains fewer cobbles. Included areas make up about 20 percent of the total acreage.

The Hanson soil is very deep and well drained. It formed in glacial outwash overlying glacial till. Typically the surface is 20 percent covered with gravel and 5 percent covered with cobbles. The surface layer is brown gravelly sandy loam 8 inches thick. The upper part of the subsoil is pinkish white and pink very cobbly loam 17 inches thick. The lower part is reddish yellow very cobbly clay loam to a depth of 60 inches or more. This Hanson soil is outside the characteristics of the Hanson series: the surface layer is slightly lighter in color and slightly thinner. This, however, does not affect the use and management of this soil for the purposes of this survey.

Permeability of the Hanson soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is medium and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

The Quander soil is very deep and well drained. It formed in glacial drift. Typically the surface is 45 percent covered with 40 percent gravel and 5 percent cobbles. The surface layer is grayish brown and brown gravelly loam 12 inches thick. The subsoil is light yellowish brown and reddish yellow very cobbly clay loam 24 inches thick. The substratum is yellow very cobbly sandy clay loam to a depth of 60 inches or more.

Permeability of the Quander soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is slight. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat. It is also used for recreation.

The potential plant community on this unit is mainly bluebunch wheatgrass, Griffith wheatgrass, and Parry danthonia. As the range condition deteriorates, Sandberg bluegrass, prairie junegrass, and threadleaf sedge increase. As the range condition further deteriorates, curlycup gumweed and cheatgrass invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges

from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds due to the content of rock fragments in the soils. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the gravel and cobbles on the surface of the soil.

This unit is in capability subclass VIe, nonirrigated. It is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

172—Hapjack-Rogert-Amesmont complex, 3 to 25 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 30 percent Hapjack gravelly sandy loam, 5 to 25 percent slopes; 30 percent Rogert gravelly sandy loam, 5 to 25 percent slopes; and 20 percent Amesmont fine sandy loam, 3 to 10 percent slopes. The Hapjack and Rogert soils are on the crests of hills, upper areas of the back slopes of hills, and upper portions of mountain slopes. The Amesmont soil is on the foot slopes and lower back slopes of hills and mountain slopes, and in swales. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Vensora loam and a soil similar to the Amesmont soil, but which is deeper than 40 inches to bedrock. Also included are very shallow soils and Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Hapjack soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is 40 percent covered with fine granitic gravel. The surface layer is brown gravelly sandy loam 3 inches thick. The subsoil is brown gravelly sandy clay loam 7 inches thick. The substratum is brown extremely gravelly sandy loam 9 inches thick. Hard granite is at a depth of 19 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Hapjack soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate. Winter winds remove the snow from the surface of this soil.

The Rogert soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is 40 percent covered with small granitic gravel. The surface layer is brown gravelly sandy loam 8 inches thick. The underlying material is brown very gravelly sandy loam 8 inches thick. Hard granite is at a depth of 16 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Rogert soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate. Winter winds remove the snow from the surface of this soil.

The Amesmont soil is moderately deep and well drained. It formed in residuum and colluvium derived from granite. Typically the surface is 20 percent covered with fine granitic gravel. The surface layer is brown fine sandy loam 5 inches thick. The upper 9 inches of the subsoil are brown sandy clay loam. The lower 6 inches are brown gravelly sandy clay loam. The substratum is strong brown very gravelly sandy clay loam 13 inches thick. Highly fractured granite is at a depth of 33 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Amesmont soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe. Winter winds deposit additional snow on this soil.

This unit is used as rangeland, for wildlife habitat, and for recreation.

The potential plant community on this unit is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the slope. The Rogert and Hapjack soils are poorly suited for mechanical range renovation and range seeding; the main limitations are the rock fragments on the surface and the droughtiness of the soils.

The Amesmont soil is moderately suited for range seeding. The main limitation is the hazard of water erosion. Mechanical range renovation may not be practical due to the amount of sagebrush growing on the soil. Brush control may be needed if the amount of brush growing on the soil is more than would be present in the potential plant community.

The Hapjack and Rogert soils are in capability subclass VIIe, nonirrigated. The Amesmont soil is in capability subclass VIe, nonirrigated. This unit is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

173—Ipson-Evanston complex, 6 to 30 percent slopes.

This map unit is on dissected fan terraces and alluvial fans. The native vegetation consists mainly of grasses and forbs. Elevation is 6,500 to 7,200 feet. The annual precipitation is 15 to 17 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Ipson gravelly sandy loam and 35 percent Evanston fine sandy loam. Ipson soils are on the convex slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blazon loam, Chaperpon loam, and Forelle loam. Included areas make up about 15 percent of the total acreage.

The Ipson soil is very deep and well drained. It formed in alluvium. Typically the surface layer is grayish brown and brown gravelly sandy loam 8 inches thick. The subsoil is brown very gravelly sandy clay loam 6 inches thick. The substratum is pale brown and very pale brown very gravelly coarse sandy loam to a depth of 60 inches or more. This soil is outside the characteristics of the Ipson series because the C horizon does not contain calcium carbonate. This difference, however, does not significantly affect the use or management of the soil.

Permeability of the Ipson soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight.

The Evanston soil is very deep and well drained. It formed in alluvium. Typically the surface layer is dark grayish brown fine sandy loam 3 inches thick. The upper part of the subsoil is dark grayish brown sandy clay loam 14 inches thick. The next part is light brownish gray clay loam 33 inches thick. The lower part is pale olive clay loam to a depth of 60 inches or more.

Permeability of the Evanston soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly needleandthread, western wheatgrass, and blue grama. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed and annual grasses invade. The potential plant community produces about 1,400 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,900 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. This unit is well suited to the production of vegetation suitable for livestock grazing.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The unit is in capability subclass VIe, nonirrigated. It is in the Loamy, 15- to 17-inch precipitation, Southern Plains range site.

174—Joemre fine sandy loam, 3 to 6 percent slopes.

This very deep, well drained soil is on alluvial fans and terraces. It formed in alluvium derived dominantly from redbed sedimentary rock. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Alcova sandy loam, Almy loam, Fiveoh sandy loam, and Wycolo sandy loam. Included areas make up about 20 percent of the total acreage.

Typically the surface layer is yellowish red fine sandy loam 2 inches thick. The upper part of the subsoil is yellowish red fine sandy loam and loam 11 inches thick. The lower part is yellowish red fine sandy loam to a depth of 60 inches or more.

Permeability of the Joemre soil is moderately rapid. Available water capacity is high. Effective rooting depth is

60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Joemre soil is mainly needleandthread, Indian ricegrass, thickspike wheatgrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. It is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

175—Joemre fine sandy loam, 6 to 15 percent slopes.

This very deep, well drained soil is on alluvial fans. It formed in alluvium derived dominantly from redbed sedimentary rock. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Alcova sandy loam, Almy loam, and Wycolo sandy loam. Included areas make up about 20 percent of the total acreage.

Typically the surface layer is brown fine sandy loam 2 inches thick. The upper part of the subsoil is reddish brown and yellowish red fine sandy loam 14 inches thick. The lower part is yellowish red fine sandy loam to a depth of 60 inches or more.

Permeability of the Joemre soil is moderately rapid. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Joemre soil is needleandthread, Indian ricegrass, thickspike wheatgrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazards of wind and water erosion. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. If practical, tillage should be along the contour of the slope. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. It is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

176—Kezar-Carbol-Rock outcrop complex, 5 to 25 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 9,000 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 35 percent Kezar sandy loam, 30 percent

Carbol sandy loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Amesmont fine sandy loam, Hapjack gravelly sandy loam, Rogert gravelly sandy loam, and Silas loam. Included areas make up about 20 percent of the total acreage.

The Kezar soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface layer is brown and dark yellowish brown sandy loam 10 inches thick. The upper part of the subsoil is brown sandy clay loam 10 inches thick. The lower part is light olive brown very cobbly sandy clay loam 11 inches thick. Hard granite is at a depth of 31 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Kezar soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Carbol soil is shallow and well drained. It formed in residuum and colluvium derived from granite. Typically the surface is 25 percent covered with gravel. The surface layer is brown sandy loam 4 inches thick. The subsoil is dark yellowish brown cobbly sandy clay loam 9 inches thick. The substratum is yellowish brown extremely cobbly sandy clay loam 6 inches thick. Hard granite is at a depth of 19 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Carbol soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

Rock outcrop consists of exposures of hard anorthositic granite.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Kezar soil is mainly bluebunch wheatgrass, prairie junegrass, Griffith wheatgrass, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Carbol soil is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. The Kezar soil is well suited to the the production of vegetation suitable for livestock grazing. Production on the Carbol soil is limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Kezar soil is in capability subclass VIe, nonirrigated. The Carbol soil is in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Kezar soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Carbol soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

177—Kildor-Rock outcrop association, 5 to 50 percent slopes.

This map unit is on mountainsides and mountain toe slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 8,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 40 percent Kildor gravelly loam and 30 percent Rock outcrop. The Kildor soil occurs on back slopes and toe slopes of mountains. The Rock outcrop occurs on shoulder slopes of mountains and escarpments.

Included in this unit are small areas of Miracle fine sandy loam and a shallow clayey soil. Also included are small areas of a very deep clayey soil on toe slopes. Included areas make up about 30 percent of the total acreage.

The Kildor soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from shale. Typically the surface is 20 percent covered with gravel and 10 percent covered with cobbles. The surface layer is dark grayish brown gravelly loam 10 inches thick. The upper part of the subsoil is yellowish brown and light olive brown clay loam 12 inches thick. The lower part is light gray clay 16 inches thick. Weakly consolidated shale is at a depth of 38 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Kildor soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

Rock outcrop consists of exposures of weakly consolidated multicolored shale.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Kildor soil is mainly bluebunch wheatgrass, prairie junegrass, Griffith wheatgrass, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, big sagebrush, and rabbitbrush increase. As the range condition further deteriorates, broom snakeweed, cactus, cheatgrass, and annuals invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. The Kildor soil is well suited to the production of vegetation suitable for livestock grazing. The amount of Rock outcrop in this unit influences the amount of the forage available for livestock grazing.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Kildor soil is in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Kildor soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

178—Kiltabar-Tismid complex, 0 to 3 percent slopes.

This map unit is on stream terraces, in drainageways, and in areas adjacent to playas and intermittent lakes. The native vegetation consists mainly of grasses and shrubs. Hummocky microrelief is common in many areas. Elevation is 6,800 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

This unit is 45 percent Kiltabar silty clay loam and 35 percent Tismid sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Elkol silty clay loam, Forelle loam, Gerdrum Family loam, and Rock River sandy loam. Also included adjacent to creeks and rivers are small areas of Glendive sandy loam and Redrob loam. Included areas make up about 20 percent of the total acreage.

The Kiltabar soil is very deep and somewhat poorly drained. It formed in alluvium. Typically the surface layer is strongly saline yellowish brown silty clay loam 1 inch thick. The upper 15 inches of the subsoil are strongly saline dark yellowish brown silty clay loam. The next 24 inches are strongly saline yellowish brown clay loam. The lower part to a depth of 60 inches or more is moderately saline yellowish brown clay loam. In some areas, the surface layer is slightly darker in color.

Permeability of the Kiltabar soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table is at a depth of 2 to 4 feet from March through September. This soil is subject to a rare hazard of flooding.

The Tismid soil is very deep and well drained. It formed in alluvium. Typically the surface layer is pale brown sandy loam 4 inches thick. The upper part of the subsoil is pale brown sandy clay loam 3 inches thick. The next 13 inches are very strongly alkaline light yellowish brown clay loam. The lower part is moderately saline light yellowish brown loam and sandy clay loam to a depth of 60 inches or more.

Permeability of the Tismid soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly alkali sacaton, basin wildrye, black greasewood, inland saltgrass, and western wheatgrass. As the range condition deteriorates, greasewood and inland saltgrass increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,800 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,500 pounds in favorable years to 1,200 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the salinity and alkalinity of the soils. Loss of

the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing.

This unit is well suited for stockwater ponds. It is poorly suited for mechanical range renovation and range seeding; the main limitation is the salinity and alkalinity of the soils. The low annual precipitation should also be of concern when planning range seedings. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity and alkalinity of the soil. Because the seedings will be only slightly successful, they should be conducted only if there are no other alternatives to forage improvement.

The Kiltabar soil is in capability subclass VIIs, nonirrigated. The Tismid soil is in capability subclass VIs, nonirrigated. This unit is in the Saline Lowland, 10- to 14-inch precipitation, High Plains Southeast range site.

179—Lakehelen-Redfeather-Amesmont complex, 5 to 20 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of trees, grasses, and shrubs. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 40 percent Lakehelen fine sandy loam, 30 percent Redfeather gravelly sandy loam, and 20 percent Amesmont fine sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Hapjack gravelly sandy loam, Rogert gravelly sandy loam, and Vensora loam. Included areas make up about 10 percent of the total acreage.

The Lakehelen soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is covered with a 2-inch-thick mat of needles, twigs, and bark in various stages of decomposition. The surface layer is light yellowish brown fine sandy loam 17 inches thick. The subsoil is strong brown very gravelly sandy clay loam 9 inches thick. The substratum is reddish brown extremely gravelly sandy loam 12 inches thick. Hard granite is at a depth of 38 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Lakehelen soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Redfeather soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is covered with a 2-inch-thick mat of needles, twigs, and bark in various stages of decomposition. The surface layer is light yellowish brown gravelly sandy loam 14 inches thick. The subsoil is brown very gravelly sandy clay loam 5 inches thick. Hard granite is at a depth of 19 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Redfeather soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Amesmont soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface layer is brown fine sandy loam 5 inches thick. The subsoil is strong brown gravelly sandy clay loam 8 inches thick. The substratum is strong brown very gravelly sandy loam 8 inches thick. Fractured granite is at a depth of 21 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Amesmont soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used mainly for recreation and for wildlife habitat. Some areas are also used as rangeland or for timber production.

The present vegetation on the Lakehelen soil is lodgepole pine or Douglas-fir with an understory of elk sedge, king spike fescue, bluegrasses, kinnikinnick, creeping juniper, aspen, heartleaf arnica, prairie thermopsis, penstemon, geranium, rose pussytoes, Oregongrape, western yarrow, Idaho fescue, Columbia needlegrass, cinquefoil, stonecrop, and larkspur.

The Lakehelen soil is moderately well suited to the production of lodgepole pine and Douglas-fir for timber harvesting. The woodland site index ranges from 35 to 45 for lodgepole pine and from 25 to 30 for Douglas-fir. Production of lodgepole pine is 25 to 35 cubic feet per acre per year. Production of Douglas-fir is 20 to 30 cubic feet per acre per year. Timber production is limited because of steepness of the slope and the slow growth of the trees.

The present vegetation on the Redfeather soil is lodgepole pine with an understory of elk sedge, kinnikinnick, bluegrasses, king spike fescue, rose pussytoes, low sedge, creeping juniper, antelope bitterbrush, Idaho fescue, western yarrow, cinquefoil, Oregongrape, and violet.

The Redfeather soil is moderately suited to the production of lodgepole pine for timber harvesting.

The site index for lodgepole pine ranges from 30 to 40. Production is 20 to 30 cubic feet per acre per year. Timber production is limited by the slow growth of the trees and the steepness of slope.

The potential plant community on the Amesmont soil is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion.

Production of vegetation suitable for livestock grazing on the Lakehelen and Redfeather soils is severely limited by the dense tree cover, which limits the growth of the understory vegetation. Production on the Amesmont soil is moderately limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Lakehelen and Amesmont soils are in capability subclass VIe, nonirrigated; the Redfeather soil is in capability subclass VIIe, nonirrigated. The Lakehelen and Redfeather soils are in the Douglas-fir woodland site. The Amesmont soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

180—Leavitt gravelly fine sandy loam, 1 to 8 percent slopes.

This very deep, well drained soil is on fan terraces. It formed in alluvium derived dominantly from granite. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 8,900 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free season is less than 60 days.

Included in this unit are small areas of Granile gravelly loam and Teeler very gravelly sandy loam. Included areas make up about 20 percent of the total acreage.

Typically the surface is 10 percent covered with gravel. The surface layer is brown gravelly fine sandy loam 6 inches thick. The upper part of the subsoil is brown gravelly loam 9 inches thick. The next part is light yellowish brown very gravelly clay loam 7 inches thick. The lower part is very pale brown very gravelly coarse sandy loam to a depth of 60 inches or more. This soil is outside the characteristics of the Leavitt series because it has slightly more gravel in the middle and lower subsoil layers. This difference, however, does not significantly affect the use or management of this soil for the purposes of this survey.

Permeability of the Leavitt soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used as rangeland and for wildlife habitat. It is also used for recreation.

The potential plant community on the Leavitt soil is mainly bluebunch wheatgrass, Idaho fescue, prairie junegrass, and Griffith wheatgrass. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, cheatgrass and annuals invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. This unit is well suited to the production of vegetation suitable for livestock grazing.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazard of wind erosion and the gravelly surface layer. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass VIs, nonirrigated. It is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

181—Leavitt-Granile complex, 3 to 45 percent slopes.

This map unit is on fan terrace escarpments. The native vegetation consists mainly of grasses. Elevation is 7,600 to 8,200 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 50 percent Leavitt gravelly loam, 3 to 45 percent slopes and 35 percent Granile gravelly sandy loam, 6 to 45 percent slopes. The components of this unit

are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Quander gravelly loam and Teeler very gravelly sandy loam. Included areas make up about 15 percent of the total acreage.

The Leavitt soil is very deep and well drained. It formed in alluvium derived dominantly from granite. Typically the surface layer is brown gravelly loam 4 inches thick. The upper part of the subsoil is brown and light yellowish brown gravelly clay loam 13 inches thick. The next part is reddish yellow very gravelly clay loam 9 inches thick. The lower part is light brown clay to a depth of 60 inches or more. This soil is outside the characteristics of the Leavitt series because it has slightly more gravel in the upper and middle subsoil layers and slightly more clay in the lower subsoil layer. This difference, however, does not significantly affect the use or management of this soil for the purposes of this survey.

Permeability of the Leavitt soil is moderate in the upper part of the subsoil and slow in the lower part of the subsoil. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

The Granile soil is very deep and well drained. It formed in alluvium derived dominantly from granite. Typically the surface is 15 percent covered with gravel and a few cobbles. The surface layer is dark grayish brown gravelly sandy loam 4 inches thick. The subsoil is brown very gravelly sandy clay loam 15 inches thick. The substratum is brown very gravelly sandy clay loam to a depth of 60 inches or more.

Permeability of the Granile soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat. It is also used for recreation.

The potential plant community on the Leavitt soil is mainly bluebunch wheatgrass, Idaho fescue, prairie junegrass, and Griffith wheatgrass. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, cheatgrass and annuals invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Granile soil is mainly bluebunch wheatgrass, Griffith wheatgrass, threetip sagebrush, black sagebrush, and Parry danthonia. As the range condition deteriorates, Sandberg bluegrass, prairie junegrass, and threadleaf sedge increase. As the range condition further deteriorates, curlycup gumweed, cheatgrass, and broom snakeweed invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. The Leavitt soil is well suited to the production of vegetation suitable for livestock grazing. Production on the Granile soil is moderately limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

This unit is in capability subclass VIIe, nonirrigated. The Leavitt soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site; the Granile soil is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

182—Leavitt-Hanson complex, 3 to 30 percent slopes.

This map unit is on fan terraces. The native vegetation consists mainly of grasses. Elevation is 7,800 to 8,200 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 60 percent Leavitt loam, 3 to 30 percent slopes and 20 percent Hanson gravelly sandy loam, 3 to 15 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Ansel gravelly sandy loam, Granile gravelly sandy loam, and Quander gravelly loam. Included areas make up about 20 percent of the total acreage.

The Leavitt soil is very deep and well drained. It formed in alluvium. Typically the surface layer is brown loam 10 inches thick. The upper part of the subsoil is light yellowish brown clay loam 16 inches thick. The lower part is pale brown loam and clay loam 25 inches thick. The substratum is very pale loam to a depth of 60 inches or more.

Permeability of the Leavitt soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water

erosion is moderate. The hazard of wind erosion is moderate.

The Hanson soil is very deep and well drained. It formed in glacial outwash. Typically the surface is 40 percent covered with gravel and 5 percent covered with cobbles. The surface layer is dark grayish brown gravelly sandy loam 8 inches thick. The upper part of the subsoil is light gray very cobbly loam 10 inches thick. The lower part is white very cobbly loam to a depth of 60 inches or more. This soil is outside the characteristics of the Hanson series because the surface layer is slightly lighter colored and slightly thinner. This difference, however, does not significantly affect the use and management of this soil for the purposes of this survey.

Permeability of the Hanson soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is medium and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat. It is also used for recreation.

The potential plant community on the Leavitt soil is mainly bluebunch wheatgrass, Idaho fescue, Griffith wheatgrass, and prairie junegrass. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, cheatgrass and annuals invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Hanson soil is mainly bluebunch wheatgrass, threetip sagebrush, Griffith wheatgrass, and Parry danthonia. As the range condition deteriorates, Sandberg bluegrass, prairie junegrass, and threadleaf sedge increase. As the range condition further deteriorates, curlycup gumweed and cheatgrass invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. The Leavitt soil is well suited to the production of vegetation suitable for livestock grazing. Production on the Hanson soil is limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds due to the potential for seepage losses and the steepness of slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the steepness of slope and the gravelly surface layer of the Hanson soil. In addition, mechanical range renovation may not be practical in many area due to the amount of sagebrush growing on the soil. Brush control may be needed in areas where there is more brush than would be present in the potential plant community.

This unit is in capability subclass VIe, nonirrigated. The Leavitt soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Hanson soil is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

183—Leavitt-Quander complex, 15 to 45 percent slopes.

This map unit is on escarpments of outwash fan terraces. The native vegetation consists mainly of grasses. Elevation is 7,600 to 8,200 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 50 percent Leavitt loam and 30 percent Quander gravelly loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Hanson gravelly sandy loam and a soil similar to the Quander soil, but with a very cobbly sandy loam subsoil. Also included are small areas of Lymanson loam. Included areas make up about 20 percent of the total acreage.

The Leavitt soil is very deep and well drained. It formed in local alluvium. Typically the surface layer is brown loam 5 inches thick. The upper part of the subsoil is brown clay loam 15 inches thick. The lower part is pale brown and yellowish brown clay loam to a depth of 60 inches or more.

Permeability of the Leavitt soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Quander soil is very deep and well drained. It formed in glacial drift. Typically the surface is 25 percent covered with gravel and 20 percent covered with cobbles. The surface layer is dark grayish brown gravelly loam 10 inches thick. The upper part of the subsoil is reddish yellow and brownish yellow very cobbly clay loam 20 inches thick. The lower part is brownish yellow very gravelly clay loam 15 inches thick. The substratum is brownish yellow very cobbly clay loam to a depth of 60 inches or more.

Permeability of the Quander soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat. It is also used for recreation.

The potential plant community on the Leavitt soil is mainly bluebunch wheatgrass, Idaho fescue, Griffith wheatgrass, and prairie junegrass. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, cheatgrass and annuals invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Quander soil is mainly bluebunch wheatgrass, Griffith wheatgrass, threetip sagebrush, black sagebrush, and Parry danthonia. As the range condition deteriorates, Sandberg bluegrass, prairie junegrass, and threadleaf sedge increase. As the range condition further deteriorates, curlycup gumweed, cheatgrass, and broom snakeweed invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. The Leavitt soil is well suited to the production of vegetation suitable for livestock grazing. Production on the Quander soil is limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

This unit is in capability subclass VIIe, nonirrigated. The Leavitt soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Quander soil is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

184—Luhon loam, 1 to 5 percent slopes.

This very deep, well drained soil is on foot slopes and toe slopes of hills and on terraces. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Cushool sandy loam, Forelle loam, Poposhia loam, and Stunner sandy loam. Also included are a soil similar to the Luhon soil that supports a very sparse amount of vegetation because of high amount of calcium carbonate close to the soil surface; a coarser textured soil that occurs east of the lower reaches of Spring Creek; and soils that have weakly consolidated bedrock within a depth of 20 to 40 inches. Included areas make up about 20 percent of the total acreage.

Typically the upper part of the surface layer is pale brown loam 2 inches thick. The lower part is light yellowish brown loam 6 inches thick. The subsoil is pale yellow and light yellowish brown silt loam to a depth of 60 inches or more. The subsoil contains a high amount of calcium carbonate.

Permeability of the Luhon soil is moderate. Available water capacity is high. Effective rooting depth is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Luhon soil is mainly bluebunch wheatgrass, mutton bluegrass, needleandthread, black sagebrush, and western wheatgrass. As the range condition deteriorates, shorter grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the high amount of calcium carbonate in the subsoil and by the low annual precipitation.

This soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. It is well suited for mechanical range renovation and range seeding. The low annual precipitation, however, should be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. It is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

185—Luvar-Stylite-Diamonkit complex, 1 to 8 percent slopes.

This map unit is on hillslopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,500 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Luvar loam, 25 percent Stylite fine sandy loam, and 15 percent Diamonkit sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Forelle loam, Luhon loam, and a shallow soil similar to the Diamonkit soil. Also included are small areas of Browtine very gravelly fine sandy loam and a sandy loam soil with a gypsiferous subsoil. Included areas make up about 20 percent of the total acreage.

The Luvar soil is very deep and well drained. It formed in alluvium. Typically the surface is 10 percent covered with gravel. The surface layer is dark brown loam 2 inches thick. The upper part of the subsoil is yellowish brown loam 10 inches thick. The next part is very pale brown clay loam 20 inches thick. The lower part to a depth of 60 inches or more is light yellowish brown loam and clay loam with common masses of gypsum.

Permeability of the Luvar soil is moderate. Available water capacity is high. Effective rooting depth is 20 to 30 inches because the high content of gypsum in the lower part of the subsoil restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

The Stylite soil is very deep and well drained. It formed in alluvium derived dominantly from gypsiferous sedimentary rock. Typically the surface layer is yellowish brown fine sandy loam 2 inches thick. The upper part of the subsoil is brown and yellowish brown loam 12 inches thick. The next part is very pale brown clay loam 16 inches thick. The lower part to a depth of 60 inches or more is pale brown loam and light yellowish clay loam with many soft masses of gypsum.

Permeability of the Stylite soil is moderate. Available water capacity is high. Effective rooting depth is 20 to 30 inches because the high content of gypsum in the lower part of the subsoil restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Diamonkit soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from gypsiferous sandstone and shale. Typically the surface layer is pale brown sandy loam 1 inch thick. The upper part of the subsoil is yellowish brown loam 21 inches thick. The lower 13 inches are pale yellow and pale brown clay loam with many soft masses of gypsum. Weakly consolidated shale bedrock is at a depth of 35 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Diamonkit soil is moderate. Available water capacity is moderate. Effective rooting depth is 15 to 25 inches because the high content of gypsum in the lower subsoil restrict root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used mainly as rangeland. It is also used for wildlife habitat.

The potential plant community on the Luvar and Stylite soils is mainly western wheatgrass, bluebunch wheatgrass, big sagebrush, and needleandthread. As the range condition deteriorates, blue grama and big sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Diamonkit soil is mainly bluebunch wheatgrass, western wheatgrass, needleandthread, black sagebrush, and mutton bluegrass. As the range condition deteriorates, prairie junegrass, Sandberg bluegrass, and big sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing on the Luvar and Stylite soils is moderately limited by the low annual precipitation. Production on the Diamonkit soil is limited by the low annual precipitation and by the shallow effective rooting depth.

This unit is poorly suited for stockwater ponds. The main limitations are the potential for seepage losses and the piping. The depth to bedrock in the Diamonkit soil is also a limitation.

This unit is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass IVe, nonirrigated. The Luvar and Stylite soils are in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Diamonkit soil is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

186—Lymanson loam-Lymanson cobbly loam complex, 6 to 20 percent slopes.

This map unit is on hills. The native vegetation consists mainly of grasses, forbs, and shrubs. Elevation is 7,800 to 9,000 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

This unit is 50 percent Lymanson loam and 30 percent Lymanson cobbly loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Buffork sandy loam and Leavitt sandy loam. Also included are small areas of soils similar to the Lymanson loam, but which are not calcareous or have a redder color. Included areas make up about 20 percent of the total acreage.

The Lymanson loam soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from sedimentary rock. Typically the surface is about 25 percent covered with gravel and cobbles. The surface layer is brown loam 7 inches thick. The upper part of the subsoil is light yellowish brown clay loam 9 inches thick. The lower part is light brownish gray clay loam 19 inches thick. Weakly consolidated shale is at a depth of 35 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of Lymanson loam soil is moderate. Available water capacity is moderate. The effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

Lymanson cobbly loam soil is moderately deep and well drained. It formed in alluvium overlying residuum derived from sedimentary rock. Typically the surface is 50 percent covered with cobbles, gravel, and a few stones. The surface layer is brown cobbly loam 7 inches thick. The upper 10 inches of the subsoil are light yellowish brown clay loam. The lower part is light yellowish brown loam 14 inches thick. Weakly consolidated sandstone is at a depth of 31 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of Lymanson cobbly loam soil is moderate. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Lymanson loam soil is mainly bluebunch wheatgrass, Idaho fescue, prairie junegrass, and Griffith wheatgrass. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, cheatgrass and annuals invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Lymanson cobbly loam soil is mainly bluebunch wheatgrass, Idaho fescue, western wheatgrass, prairie junegrass, and threetip sagebrush. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,300 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,700 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. This unit is well suited to the production of vegetation suitable for livestock grazing.

This unit is poorly suited for stockwater ponds due to the steepness of slope and the depth to bedrock. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the cobbly surface layer in some areas and the hazard of water erosion. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass VIe, nonirrigated. The Lymanson loam soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range

site. The Lymanson cobbly loam soil is in the Coarse Upland, 15- to 19-inch precipitation, Foothills and Mountains, Southeast range site.

187—Manada sandy loam, 0 to 6 percent slopes.

This very deep, somewhat poorly drained soil is on fan terraces. It formed in alluvium. The vegetation is mainly irrigated native grass, hay, and pasture. Elevation is 7,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

Included in this unit are small areas of Browtine very gravelly sandy loam, Folavar gravelly sandy loam, Hilltoppe very gravelly sandy loam, and McFadden gravelly fine sandy loam. Included areas make up about 25 percent of the total acreage.

Typically the surface is 10 percent covered with medium and fine gravel. The surface layer is dark grayish brown sandy loam 2 inches thick. The upper part of the subsoil is brown loam 7 inches thick. The next part is very pale brown and light gray gravelly sandy loam 18 inches thick. The next part to a depth of 35 inches are white gravelly loam. It contains a high amount of calcium carbonate. The lower part is very pale brown gravelly sandy loam to a depth of 60 inches or more.

Permeability of the Manada soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more for some plants; for other it is 24 to 36 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe. From April through July a seasonal high water table is at a depth of 2 and 3 feet. The water table is below a depth of 3 feet the remainder of the year.

This unit is used mainly for irrigated hay and pasture.

If this unit is used for hay and pasture, the main limitation is the high content of calcium carbonate in the lower subsoil layers because this affects rooting depth and nutrient availability. In addition, applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

This unit is in capability subclass IVw, irrigated and nonirrigated.

188—McFadden gravelly fine sandy loam, 1 to 6 percent slopes.

This very deep, well drained soil is on fan terraces. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 38 to 40 degrees F, and the average frost-free period is 85 to 110 days.

Included in this unit are small areas of Browtine very gravelly fine sandy loam, Hilltoppe very gravelly sandy loam, Luhon loam, Lupinto gravelly fine sandy loam, and Stunner sandy loam. Included areas make up about 20 percent of the total acreage.

Typically the surface is about 15 percent covered with gravel. The surface layer is brown gravelly fine sandy loam 5 inches thick. The upper part of the subsoil is pale brown and very pale brown gravelly fine sandy loam 13 inches thick. The substratum is light gray loam to a depth of 60 inches or more. The subsoil and substratum contain a high amount of calcium carbonate.

Permeability of the McFadden soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more for some plants; for others it is only 10 to 30 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the McFadden soil is mainly bluebunch wheatgrass, Indian ricegrass, threadleaf sedge, mutton bluegrass, and needleandthread. As the range condition deteriorates, shorter species of grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the high content of calcium carbonate in the subsoil and by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazard of wind erosion and the gravelly surface layer. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass IVe, nonirrigated. It is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this soil near the Platte County line near Highway 34 are in a similar range site in the 12- to 14-inch precipitation Southern Plains zone.

189—Miracle-Cheadle association, 5 to 20 percent slopes.

This map unit is on cuestas. The native vegetation consists mainly of grasses, shrubs, and a few trees. Elevation is 7,600 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 45 percent Miracle fine sandy loam, 5 to 10 percent slopes and 30 percent Cheadle fine sandy loam, 8 to 20 percent slopes. The Miracle soil is on slightly convex slopes. The Cheadle soil is on more convex slopes, often adjacent to Rock outcrops.

Included in this unit are small areas of Passcreek fine sandy loam, Cheadle cobbly very fine sandy loam, sandstone Rock outcrop, and a very deep soil similar to the Miracle soil. Also included are small areas of limestone Rock outcrop and sandy soils. Included areas make up about 25 percent of the total acreage.

The Miracle soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from sandstone and shale. Typically the surface layer is brown fine sandy loam 4 inches thick. The upper 8 inches of the subsoil are brown sandy clay loam. The next 16 inches are red and reddish brown sandy clay loam. The lower part is reddish brown sandy loam 5 inches thick. Hard sandstone is at a depth of 33 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Miracle soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Cheadle soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from interbedded sandstone and limestone. Typically the surface is 35 percent covered with gravel and cobbles. The surface layer is brown fine sandy loam 4 inches thick. The subsoil is brown channery fine sandy loam 5 inches thick. The substratum is yellowish red very channery fine sandy loam 7 inches thick. Hard sandstone is at a depth of 16 inches. Depth to bedrock ranges from 10 to 20 inches. This soil is outside the characteristics of the Cheadle series because it does not have a horizon which contains an accumulation of calcium carbonate. This difference, however, does not significantly affect the use or management of this soil.

Permeability of the Cheadle soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe. Winter winds remove the snow from the surface of this soil.

This unit is used mainly as rangeland and for wildlife habitat. It is also used for recreation.

The potential plant community on the Miracle soil is mainly bluebunch wheatgrass, prairie junegrass, Griffith wheatgrass, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Cheadle soil is mainly bluebunch wheatgrass, threetip sagebrush, black sagebrush, and Parry danthonia. As the range condition deteriorates, Sandberg bluegrass, prairie junegrass, and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. The Miracle soil is well suited the production of vegetation suitable for livestock grazing. Production on the Cheadle soil is limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the steepness of slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the cobbles on the surface of the Cheadle soil and the hazard of water erosion.

The Miracle soil is in capability subclass VIe, nonirrigated. The Cheadle soil is in capability subclass VIIe, nonirrigated. The Miracle soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Cheadle soil is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

190—Moyerson-Kemmerer complex, 3 to 20 percent slopes.

This map unit is on escarpments. The native vegetation consists mainly of grasses, forbs, and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Moyerson silty clay loam and 30 percent Kemmerer clay loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blazon clay loam, Chaperton clay loam, Diamondville fine sandy loam, and Pinelli clay loam. Also included are small areas of Rock outcrop and a soil similar to the Kemmerer soil, but with a more pronounced subsoil. Included areas make up about 30 percent of the total acreage.

The Moyerson soil is shallow and well drained. It formed in residuum and alluvium derived dominantly from shale. Typically the surface is about 5 percent covered with slate fragments and 10 percent covered with igneous gravel and cobbles. The surface layer is light brownish gray silty clay loam 4 inches thick. The underlying material is light brownish gray and light gray silty clay about 13 inches thick. Weakly consolidated shale is at a depth of 17 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Moyerson soil is slow. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Kemmerer soil is moderately deep and well drained. It formed in residuum and alluvium derived dominantly from shale. Typically the surface layer is light brownish gray clay loam 2 inches thick. The upper part of the subsoil is grayish brown clay loam 13 inches thick. The lower part is gray silty clay loam and olive gray silty clay 19 inches thick. Weakly consolidated shale is at a depth of 34 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Kemmerer soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly western wheatgrass, bottlebrush squirreltail, birdfoot sagebrush, gardner saltbush, and Indian ricegrass. As the range condition deteriorates, birdfoot sagebrush increases. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 500 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the droughtiness and alkalinity of the soils, and by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the hazard of water erosion and alkalinity of the soils.

The Moyerson soil is in capability subclass VIIe, nonirrigated. The Kemmerer soil is in capability subclass VIe, nonirrigated. This unit is in the Impervious Clay, 10- to 14-inch precipitation, High Plains Southeast range site.

191—Nathale-Passcreek, cobbly subsoil-Rock outcrop complex, 10 to 60 percent slopes.

This map unit is on mountain slopes and canyon sides. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 35 percent Nathale gravelly fine sandy loam; 35 percent Passcreek very fine sandy loam, cobbly subsoil; and 10 percent Rock outcrop. The Nathale soil occurs throughout the unit but is predominantly on south-facing canyon sides. The Passcreek soil is on north-facing canyon sides. The Rock outcrop is interspersed throughout the unit and occurs as ledges.

Included in this unit are small areas of Cheadle fine sandy loam, Miracle fine sandy loam, Rimton very fine sandy loam, and Cheadle cobbly very fine sandy loam. Also included is a deep soil similar to the Miracle soil. Included areas make up about 20 percent of the total acreage.

The Nathale soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from interbedded limestone and sandstone. Typically the

surface is 60 percent covered with gravel and cobbles. The surface layer is brown gravelly fine sandy loam 4 inches thick. The upper 7 inches of the subsoil are brown very cobbly very fine sandy loam. The lower part is pale brown very cobbly very fine sandy loam and very cobbly fine sandy loam 13 inches thick. Hard limestone is at a depth of 24 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Nathale soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Passcreek soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from limestone. Typically the surface layer is dark brown very fine sandy loam 7 inches thick. The upper part of the subsoil is dark yellowish brown sandy clay loam 9 inches thick. The lower part is brown very cobbly fine sandy loam 15 inches thick. Hard limestone is at a depth of 31 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Passcreek soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

Rock outcrop consists of exposures of interbedded limestone and sandstone.

This unit is used mainly for wildlife habitat. A few areas are also used as rangeland.

The potential plant community on the Nathale soil is mainly bluebunch wheatgrass, Idaho fescue, prairie junegrass, and western wheatgrass. As the range condition deteriorates, blue grama and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,300 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,700 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Passcreek soil is mainly bluebunch wheatgrass, prairie junegrass, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing on the Nathale soil is limited by the droughtiness of the soil; the Passcreek soil is well suited to production.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Nathale and Passcreek soils are in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Nathale soil is in the Coarse Upland, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Passcreek soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

192—Pahlow gravelly sandy loam, 0 to 3 percent slopes.

This very deep, well drained soil is on terraces with a mound-intermound pattern of microrelief. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

Included in this unit are small areas of Folavar very gravelly sandy loam; Borollic Camborthids soils; and a soil similar to the Pahlow soil, but with a 10- to 20-inch-thick loamy layer over gravelly sand. In areas near Boswell, wet areas and soils with stones and cobbles are included in the profile. Included areas make up about 15 percent of the total acreage.

Typically the surface is 25 percent covered with gravel. The surface layer is brown gravelly sandy loam 3 inches thick. The upper part of the subsoil is dark yellowish brown and brown very gravelly sandy loam 12 inches thick. The lower part is pale brown very gravelly loamy sand and extremely gravelly loamy sand to a depth of 60 inches or more.

Permeability of the Pahlow soil is moderately rapid in the upper part of the subsoil and rapid in the lower part. Available water capacity is very low. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for irrigated hay or pasture. It is also used for wildlife habitat.

If this unit is used for hay and pasture, the main limitations are the hummocky terrain and the droughtiness of the soil. Frequent applications of irrigation water will be necessary because of the limited available water capacity

of the soil. To avoid overirrigating and leaching of plant nutrients, applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Pahlow soil is mainly needleandthread, Indian ricegrass, threadleaf sedge, silver sagebrush, and thickspike wheatgrass. As the range condition deteriorates, big sagebrush, rabbitbrush, cactus, and thinleaf sedge increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazard of wind erosion and the gravelly surface layer. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass VIs, nonirrigated and irrigated. It is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

193—Pilotpeak-Canwall complex, 3 to 20 percent slopes.

This map unit is on cuesta dip slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 55 percent Pilotpeak cobbly very fine sandy loam and 25 percent Canwall fine sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Bruja very cobbly fine sandy loam, Telecan fine sandy loam, and Tieside sandy loam. Also included are small areas of limestone and sandstone Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Pilotpeak soil is very shallow or shallow and well drained. It formed in residuum and colluvium derived dominantly from limestone. Typically the surface layer is 60 percent covered with gravel and cobbles. The surface layer is yellowish brown cobbly very fine sandy loam 4 inches thick. The upper part of the subsoil is brown very cobbly very fine sandy loam 10 inches thick. The lower 4 inches are pale brown extremely cobbly very fine sandy loam. Hard limestone is at a depth of 18 inches. Depth to bedrock ranges from 7 to 20 inches.

Permeability of the Pilotpeak soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 7 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate. Winter winds remove the snow from the surface of this soil.

The Canwall soil is moderately deep and well drained. It formed in eolian deposits and colluvium overlying residuum derived from limestone. Typically the surface layer is yellowish brown fine sandy loam 3 inches thick. The upper 9 inches of the subsoil are brown very fine sandy loam. The next 4 inches are brown very cobbly very fine sandy loam. The lower part is very pale brown very cobbly very fine sandy loam about 8 inches thick. Hard limestone is at a depth of 24 inches. Depth to bedrock ranges from 20 to 40 inches. The middle and lower parts of the subsoil contain a high amount of calcium carbonate.

Permeability of the Canwall soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root development. Runoff is medium and the hazard of water erosion is severe. The hazard of wind erosion is severe.

This unit is used mainly as rangeland, for wildlife habitat, and for recreation.

The potential plant community on the Pilotpeak soil is mainly bluebunch wheatgrass, western wheatgrass, bottlebrush squirreltail, antelope bitterbrush, and black sagebrush. As the range condition deteriorates, juniper, black sagebrush, and threadleaf sedge increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 450 pounds of air-dry vegetation per acre in normal years. Production ranges from 600 pounds in favorable years to 300 pounds in unfavorable years.

The potential plant community on the Canwall soil is mainly bluebunch wheatgrass, Indian ricegrass, and needleandthread. As the range condition deteriorates, shorter species of grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the low annual precipitation and by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the steepness of slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the cobbly surface layer of the Pilotpeak soil and the hazard of water erosion.

The Pilotpeak soil is in capability subclass VIIe, nonirrigated. The Canwall soil is in capability subclass VIe, nonirrigated. The Pilotpeak soil is in the Very Shallow, 10- to 14-inch precipitation, High Plains Southeast range site. The Canwall soil is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch precipitation Southern Plains zone.

194—Pinelli clay loam, 0 to 6 percent slopes.

This very deep, well drained soil on is terraces, in drainageways of pediments, and in small playas. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Absher loam, Elkol silty clay loam, Forelle loam, and Kemmerer clay loam. Also included are small areas of a moderately deep soil similar to the Pinelli soil. Included areas make up about 25 percent of the total acreage.

Typically the surface layer is light brownish gray clay loam 6 inches thick. The upper part of the subsoil is light brownish gray clay and silty clay 22 inches thick. The lower part to a depth of 60 inches or more is light brownish gray clay loam.

Permeability of the Pinelli soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Pinelli soil is mainly thickspike wheatgrass, green needlegrass, and birdfoot sagebrush. As the range condition deteriorates, forbs and big sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,300 pounds in favorable years to 500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. This soil is well suited to the production of vegetation suitable for livestock grazing.

This soil is well suited for stockwater ponds, mechanical range renovation, and range seeding. The low annual precipitation, however, should be of concern when planning range seedings.

This unit is in capability subclass IVe, nonirrigated. It is in the Clayey, 10- to 14-inch precipitation, High Plains Southeast range site.

195—Pits, mine.

This map unit consists of areas in which the original soil has been totally removed in the mining of gravel for aggregate and the quarrying of limestone for cement. Gravel pits usually are on large stream terraces and quarries are on the older sedimentary bedrock of the Laramie Range. In the gravel pits, most of the gravel is removed usually exposing weakly consolidated bedrock. In quarries, hard bedrock usually is exposed.

A few areas of quarries are in metamorphic rock, which is mined for decorator rock; or in igneous rock, which is dmined for titanium and other minerals.

This map unit is in capability subclass VIIIs.

196—Poin-Bowen-Rock outcrop complex, 10 to 50 percent slopes.

This map unit is on mountain slopes. The native vegetation consists mainly of grasses and shrubs, with a few trees. Elevation is 7,600 to 8,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 30 percent Poin very cobbly sandy loam, 15 to 50 percent slopes; 30 percent Bowen gravelly sandy loam, 10 to 20 percent slopes; and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Rogert fine sandy loam, a very deep very gravelly loamy soil with a calcareous layer, and a very deep very gravelly loamy soil on toe slopes. Included areas make up about 20 percent of the total acreage.

The Poin soil is shallow and well drained. It formed in colluvium and residuum derived dominantly from schist and gneiss. Typically the surface is 30 percent covered with cobbles and stones. The surface layer is dark brown very cobbly sandy loam 6 inches thick. The underlying material is dark grayish brown very channery sandy loam 9 inches thick. Hard schist is at a depth of 15 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Poin soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

The Bowen soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from schist and gneiss. Typically the surface is 20 percent covered with gravel and cobbles. The surface layer is dark brown gravelly sandy loam 8 inches thick. The subsoil is dark yellowish brown very gravelly sandy clay loam and brown very gravelly sandy loam 14 inches thick. The substratum is brown very cobbly sandy loam 9 inches thick. Hard schist is at a depth of 31 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Bowen soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is medium. The hazard of wind erosion is slight.

Rock outcrop consists of exposures of schist, gneiss, and granite.

This unit is used mainly as rangeland and for wildlife habitat. A few areas at the bases of mountain slopes are used for homesites and recreational developments.

The potential plant community on this unit is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

If the Poin and Bowen soils are used for homesites and recreational development, the main limitations are the steepness of slope and the depth to bedrock. Septic tank absorption fields do not function properly if installed in or on the bedrock. Effluent may surface downslope, thus creating a health hazard. The depth to bedrock makes excavating to the depths normally required for construction difficult.

The Poin soil is in capability subclass VIIe, nonirrigated. The Bowen soil is in capability subclass VIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. This unit is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

197—Poposhia-Blazon complex, 3 to 15 percent slopes.

This map unit is on hills. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Poposhia fine sandy loam, 3 to 10 percent slopes and 25 percent Blazon loam, 8 to 15 percent slopes. The Poposhia soil is on foot slopes and lower back slopes of hills. The Blazon soil is on the upper back slopes and shoulders of hills. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are areas of Chaperton loam and of a soil similar to the Blazon soil, but which is less than 10 inches deep to bedrock. Also included are areas of Blackhall sandy loam and Satanka fine sandy loam. Included areas make up about 25 percent of the total acreage.

The Poposhia soil is very deep and well drained. It formed in alluvium. Typically the surface layer is pale brown fine sandy loam 2 inches thick. The subsoil is brown and very pale brown loam 15 inches thick. The substratum to a depth of 60 inches or more is light yellowish brown loam.

Permeability of the Poposhia soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Blazon soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from interbedded shale and sandstone. Typically the surface layer is pale brown loam 2 inches thick. The underlying material is very pale brown clay loam 10 inches thick. Weakly consolidated platy shale is at a depth of 12 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Blazon soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Poposhia soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Blazon soil is mainly western wheatgrass, bluebunch wheatgrass, mutton bluegrass, bottlebrush squirreltail, and winterfat. As the range condition deteriorates, shorter grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 800 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,000 pounds in favorable years to 500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion.

Production of vegetation on the Poposhia soil suitable for livestock grazing is moderately limited by the low annual precipitation. Production on the Blazon soil is limited by the droughtiness of the soil and by the low annual precipitation.

The Poposhia soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. The Blazon soil is poorly suited for stockwater ponds due to the depth to bedrock. The Poposhia soil is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazards of wind and water erosion. The Blazon soil is poorly suited for mechanical range renovation and range seeding; the main limitations are the droughtiness of the soil and the hazard of water erosion. The low annual precipitation should also be of concern when planning range seedings. To reduce the hazard of erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Tillage should be along the contour of the slope.

The Poposhia soil is in capability subclass IVe, nonirrigated. The Blazon soil is in capability subclass VIIs, nonirrigated. The Poposhia soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Blazon soil is in the Shallow Clayey, 10- to 14-inch precipitation, High Plains Southeast range site.

198—Poposhia-Forelle complex, 1 to 8 percent slopes.

This map unit is on fan aprons. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Poposhia loam, 2 to 8 percent slopes and 25 percent Forelle fine sandy loam, 1 to 5 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Chaperton loam, Luhon loam, Rock River sandy loam, and Tisworth sandy clay loam. Included areas make up about 25 percent of the total acreage.

The Poposhia soil is very deep and well drained. It formed in alluvium. Typically the surface layer is light yellowish brown loam 2 inches thick. The subsoil to a depth of 60 inches or more is light yellowish brown clay loam.

Permeability of the Poposhia soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

The Forelle soil is very deep and well drained. It formed in alluvium. Typically the surface layer is pale brown fine sandy loam 2 inches thick. The upper part of the subsoil is yellowish brown clay loam 15 inches thick. The lower part to a depth of 60 inches or more is very pale brown and light gray sandy clay loam.

Permeability of the Forelle soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community in this unit is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This unit is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. It is well suited for mechanical range renovation and range seeding. The low annual precipitation, however, should be of concern when planning range seedings.

This unit is in capability subclass IVe, nonirrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Platte County near Highway 34 are in similar range sites in the 12- to 14-inch precipitation Southern Plains zone.

199—Poposhia-Chaperton association, 6 to 12 percent slopes.

This map unit is on hills. The native vegetation consists mainly of grasses. Elevation is 6,800 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Poposhia loam, 6 to 9 percent slopes and 30 percent Chaperton clay loam, 8 to 12 percent slopes. The Poposhia soil is on crests and foot slopes of hills, while the Chaperton soil is on shoulders and back slopes of hills.

Included in this unit are small areas of Blazon loam on the shoulders and back slopes of hills, Forelle loam and Ryan Park fine sandy loam in drainageways, and Luhon loam on the foot slopes of hills. Included areas make up about 25 percent of the total acreage.

The Poposhia soil is very deep and well drained. It formed in alluvium. Typically the surface layer is dark yellowish brown and yellowish brown loam 5 inches thick. The subsoil is brown and grayish brown loam to a depth of 60 inches or more.

Permeability of the Poposhia soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Chaperton soil is moderately deep and well drained. It formed in residuum and alluvium derived from shale. Typically the surface layer is pale brown clay loam 3 inches thick. The upper part of the subsoil is brownish gray clay loam 10 inches thick. The lower part is light brownish gray clay loam 12 inches thick. Weakly consolidated shale is at a depth of 25 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Chaperton soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

The Poposhia soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. The Chaperton soil is poorly suited for stockwater ponds due to the depth to bedrock and slope. This unit is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of water erosion. The low annual precipitation should also be of concern when planning range seedings. To reduce the hazard of erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Tillage should be along the contour of the slope.

This unit is in capability subclass IVe, nonirrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch

precipitation Southern Plains zone. Areas of this map unit near the Platte County line near Highway 34 are in similar range sites in the 12- to 14-inch precipitation Southern Plains zone.

200—Rainbolt-Morset association, 3 to 25 percent slopes.

This map unit is on hills. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,400 to 8,200 feet. The annual precipitation is 10 to 17 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 40 percent Rainbolt gravelly sandy loam, 3 to 25 percent slopes and 30 percent Morset gravelly sandy loam, 3 to 10 percent slopes. The Rainbolt soil is on the back slopes and foot slopes of hills. The Morset soil is on the toe slopes of hills.

Included in this unit are small areas of Hapjack gravelly sandy loam, Kezar fine sandy loam, and Wycolo fine sandy loam. Also included are small areas of shallow very gravelly soils. Included areas make up about 30 percent of the total acreage.

The Rainbolt soil is moderately deep and well drained. It formed in alluvium derived dominantly from granitic and sedimentary sources. Typically the surface layer is brown gravelly sandy loam 2 inches thick. The upper part of the subsoil is dark brown and reddish brown gravelly sandy clay loam 14 inches thick. The lower part is reddish brown sandy clay loam 12 inches thick. Weakly consolidated sandstone is at a depth of 28 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Rainbolt soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Morset soil is very deep and well drained. It formed in alluvium derived from granitic and sedimentary sources. Typically the surface layer is dark grayish brown gravelly sandy loam 2 inches thick. The upper part of the subsoil is dark grayish brown and brown gravelly sandy clay loam 11 inches thick. The next part is very pale brown gravelly sandy clay loam 9 inches thick. The lower part is yellowish brown and light yellowish brown gravelly sandy clay loam to a depth of 60 inches or more.

Permeability of the Morset soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly bluebunch wheatgrass, prairie junegrass, Griffith wheatgrass, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, big sagebrush, and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. This unit is well suited to the production of vegetation suitable for livestock grazing.

The Rainbolt soil is poorly suited for stockwater ponds due to the depth to bedrock and slope. The Morset soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. This unit is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazards of wind and water erosion. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of erosion. Tillage should be along the contour of the slope. Tillage for range improvement in areas with a slope of more than 15 percent is not recommended. Interseeding and seedbed preparation by band spraying of herbicides can be used in these areas.

This unit is in capability subclass VIe, nonirrigated. It is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. Some small areas are in the Coarse Loamy, 15- to 19-inch precipitation, High Plains Southeast range site. A few areas are in the Loamy, 10- to 14-inch precipitation, Foothills and Mountains Southeast range site.

201—Redfeather-Lakehelen-Rogert complex, 20 to 50 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of trees, shrubs, and grasses. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 35 percent Redfeather fine sandy loam, 35 percent Lakehelen fine sandy loam, and 20 percent Rogert gravelly sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Amesmont gravelly fine sandy loam, Hapjack gravelly sandy loam,

and Silas loam. Also included are areas of granite Rock outcrop; a soil similar to the Lakehelen soil, but with weakly consolidated schist at a depth of 20 inches, and small areas of a coarse textured soil in the Jelm Mountain area. Included areas make up about 10 percent of the total acreage.

The Redfeather soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is covered by a 2-inch-thick mat of needles, twigs, and bark in various stages of decomposition. The surface layer is pale brown fine sandy loam 14 inches thick. The subsoil is strong brown very gravelly sandy clay loam 5 inches thick. Hard granite is at a depth of 19 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Redfeather soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

The Lakehelen soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is covered with a 3-inch-thick mat of twigs, needles, and bark in various stages of decomposition. The surface layer is pale brown fine sandy loam 18 inches thick. The subsoil is strong brown very gravelly sandy clay loam 20 inches thick. Hard granite is at a depth of 38 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Lakehelen soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

The Rogert soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is 50 percent covered with granitic gravel. The surface layer is brown gravelly sandy loam 4 inches thick. The subsoil is dark brown very gravelly sandy loam 8 inches thick. The substratum is brown very gravelly sandy loam 6 inches thick. Hard granite is at a depth of 18 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Rogert soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is moderate. The hazard of wind erosion is moderate. Winter winds remove the snow from the surface of this soil.

This unit is used mainly for recreation and for wildlife habitat. Some areas are also used as rangeland or for timber production.

The present vegetation on the Redfeather soil is lodgepole pine with an understory of elk sedge, kinnikinnick, bluegrasses, king spike fescue, rose pussytoes, low sedge, creeping juniper, antelope bitterbrush, Idaho fescue, western yarrow, cinquefoil, Oregongrape, and violet.

The Redfeather soil is moderately suited to the production of lodgepole pine for timber harvesting. Production of lodgepole pine is 15 to 25 cubic feet per acre per year. Use of this soil for the production and harvesting of timber is limited by the steepness of slope and by the slow growth of the trees.

The present vegetation on the Lakehelen soil is lodgepole pine and Douglas-fir, with an understory of elk sedge, king spike fescue, bluegrasses, kinnikinnick, creeping juniper, aspen, heartleaf arnica, prairie thermopsis, penstemon, geranium, rose pussytoes, Oregongrape, western yarrow, Idaho fescue, Columbia needlegrass, cinquefoil, stonecrop, and larkspur.

The Lakehelen soil is moderately suited to the production of lodgepole pine and Douglas-fir for timber harvesting. Production of the lodgepole pine is 25 to 35 cubic feet per acre per year. Production of Douglas-fir is 20 to 30 cubic feet per acre per year. Use of this soil for the production and harvesting of timber is limited by the steepness of slope and by the slow growth of the trees.

The potential plant community on the Rogert soil is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

Production of vegetation suitable for livestock grazing on the Redfeather and Lakehelen soils is severely limited by the dense tree cover, which limits the growth of the understory. Production on the Rogert soil is moderately limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

This unit is in capability subclass VIIe, nonirrigated. The Redfeather and Lakehelen soils are in a woodland site. The Rogert soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

202—Redrob loam, 0 to 2 percent slopes.

This very deep, poorly drained soil is on flood plains and low stream terraces. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation

is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Glendive loam and the frequently flooded Redrob loam. Also included are small areas of a soil with a thicker surface layer and a slightly higher salinity. Included areas make up about 15 percent of the total acreage.

Typically the upper part of the surface layer is slightly saline very dark grayish brown loam 7 inches thick. The next 16 inches are slightly saline dark grayish brown loam. The upper 10 inches of the underlying material are slightly saline brown loam. The lower part to a depth to a depth of 60 inches or more is light brownish gray very gravelly sand.

Permeability of the Redrob soil is moderate in the upper part and very rapid in the lower part. Available water capacity is moderate. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is 10 to 20 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. From March through August, a seasonal high water table fluctuates between 1 and 2 feet. During the remainder of the year, depth to the water table is between 1.5 and 3.5 feet. This soil is subject to a rare hazard of flooding.

This unit is used mainly for irrigated hay and pasture. It is also used as rangeland and for wildlife habitat.

If this unit is used for hay and pasture, the main limitations are the wetness and the slight salinity of the soil. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Redrob soil is mainly alkali sacaton, basin wildrye, and alkali bluegrass. As the range condition deteriorates, inland saltgrass and greasewood increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 3,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 3,400 pounds in favorable years to 2,500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the wetness and salinity of the soil. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure.

This soil is well suited for stockwater ponds. Pits dug sufficiently deeper than the level of the water table can provide water for livestock. Due to the seepage potential of the soil, pits and other ponds will not hold water above the level of the water table for a long period of time. This soil is poorly suited for mechanical range renovation and range seeding; the main limitations are wetness and salinity of the soil. Use of equipment on this soil is limited to the period of the year when the water table is at its deepest level. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity of the soil.

This unit is in capability subclass IVw, nonirrigated and irrigated. It is in the Saline Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site.

203—Redrob, frequently flooded-Grenoble-Redrob complex, 0 to 3 percent slopes.

This map unit is on flood plains and low stream terraces. (See figure 6.) The native vegetation consists mainly of grasses and sedges. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Redrob loam, frequently flooded; 35 percent Grenoble gravelly sandy loam; and 15 percent Redrob very fine sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Gerrard loam, Glendive loam, and Riverwash. Included areas make up about 10 percent of the total acreage.

The Redrob, frequently flooded soil is very deep and poorly drained. It formed in alluvium. Typically the surface layer is slightly saline dark grayish brown loam 14 inches thick. The upper 9 inches of the underlying material are stratified brown loam and fine sandy loam and is slightly saline. The lower part to a depth of 60 inches or more is light yellowish brown very gravelly sand.

Permeability of the Redrob, frequently flooded soil is moderate in the upper part and very rapid in the lower

Figure 6.—An area along the Laramie River of the detailed soil map unit of Redrob, frequently flooded-Grenoble-Redrob complex, 0 to 3 percent slopes.

part. Available water capacity is low. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is only 0 to 18 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table fluctuates between 0 and 18 inches from March through August. This soil is subject to frequent brief periods of flooding from May through June.

The Grenoble soil is very deep and somewhat poorly drained. It formed in alluvium. Typically the surface is 35 percent covered with fine gravel. The surface layer is grayish brown gravelly sandy loam 5 inches thick. The upper part of the underlying material is light yellowish brown very gravelly loamy sand 20 inches thick. The lower part to a depth of 60 inches or more is light yellowish brown very gravelly sand.

Permeability of the Grenoble soil is very rapid. Available water capacity is very low. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is only 24 to 42 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is moderate. The hazard of wind erosion is moderate. A seasonal high water table is at a depth of 24 and 41 inches from March through August. This soil is subject to frequent brief periods of flooding from May through June.

The Redrob soil is very deep and poorly drained. It formed in alluvium. Typically the upper part of the surface

layer is slightly saline brown very fine sandy loam 5 inches thick. The lower part is slightly saline very dark grayish brown loam 16 inches thick. The upper part of the underlying material is brown loam 17 inches thick. The lower part to a depth of 60 inches or more is strong brown very gravelly loamy sand.

Permeability of the Redrob soil is moderate in the upper part and very rapid in the lower part. Available water capacity is moderate. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is only 12 to 24 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe. From March through August, the water table fluctuates between a depth of 1 and 2 feet. The water table is between 2 and 4 feet during the remainder of the year. This soil is subject to a rare hazard of flooding.

This unit is used mainly for irrigated hay and pasture. It is also used as rangeland and for wildlife habitat.

If this unit is used for hay and pasture, the main limitations are wetness and slight salinity of the soil. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Redrob soils is mainly alkali sacaton, basin wildrye, and alkali bluegrass. As the range condition deteriorates, inland saltgrass and greasewood increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 3,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 3,400 pounds in favorable years to 2,500 pounds in unfavorable years.

The potential plant community on the Grenoble soil is mainly alkali sacaton, basin wildrye, inland saltgrass, and western wheatgrass. As the range condition deteriorates, greasewood and inland saltgrass increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,800 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,500 pounds in favorable years to 1,200 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure. Production of vegetation suitable for livestock grazing is limited by the salinity and wetness of the soils.

This unit is well suited for stockwater ponds. Pits dug sufficiently deeper than the level of the water table can provide water for livestock. Due to the seepage potential of the soils, pits and other ponds will not hold water above the level of the water table for a long period of time. Because the water table is at a more shallow depth in the Redrob soil than the other soils, it is better suited for these pits. This unit is poorly suited for mechanical range renovation and range seeding; the main limitations are wetness and salinity of the soils. Use of equipment on this soil is limited to the period of the year when the water table is at its deepest level. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity of the soils.

The Redrob, frequently flooded soil is in capability subclass VIw, nonirrigated and irrigated. The Grenoble soil is in capability subclass VIs, nonirrigated and irrigated. The Redrob soil is in capability subclass IVw, nonirrigated and irrigated. The Redrob soils are in the Saline Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site. The Grenoble soil is in the Saline Lowland, 10- to 14-inch precipitation, High Plains Southeast range site.

204—Redrob, frequently flooded-Redrob loams, 0 to 3 percent slopes.

This map unit is on flood plains and low stream terraces. The native vegetation consists mainly of grasses and grasslike plants. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Redrob loam, frequently flooded, and 35 percent Redrob loam. The Redrob loam, frequently flooded soil is in low areas and sloughs with slopes of 0 to 2 percent. The Redrob loam is on the slightly higher areas with slopes of 1 to 3 percent. The components of this unit are so intricately intermingled

that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Grenoble gravelly sandy loam, Riverwash, and a soil similar to Redrob loam but with a thicker surface layer. Also included are soils with a slightly saline surface layer. Included areas make up about 20 percent of the total acreage.

The Redrob, frequently flooded soil is very deep and poorly drained. It formed in alluvium. Typically the upper part of the surface layer is slightly saline grayish brown loam 3 inches thick. The lower 20 inches are slightly saline very dark gray loam. The upper part of the underlying material is slightly saline grayish brown loam and sandy clay loam 12 inches thick. The lower part to a depth of 60 inches or more is light olive brown very gravelly sand.

Permeability of the Redrob, frequently flooded soil is moderate in the upper part and very rapid in the lower part. Available water capacity is moderate. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is 5 to 18 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. From March through August, a water table fluctuates between 0 and 1.5 feet. During the remainder of the year, the water table is between 1.5 and 3 feet. This soil is subject to brief, frequent periods of flooding from May through June.

The Redrob soil is very deep and poorly drained. It formed in alluvium. Typically the surface layer is slightly saline grayish brown and very dark grayish brown loam 18 inches thick. The upper 7 inches of the underlying material are slightly saline light olive brown sandy clay loam. The lower part to a depth of 60 inches or more is very gravelly sand stratified with thin lenses of sand.

Permeability of this Redrob soil is moderate in the upper part and very rapid in the lower part. Available water capacity is moderate. Effective rooting depth is 30 to 40 inches for water-tolerant plants, but it is only 12 to 24 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. From March through August, a water table fluctuates between a depth of 1 and 2 feet. The water table is between 1.5 and 3.5 feet during the remainder of the year. This soil is subject to a rare hazard of flooding.

This unit is used mainly for irrigated hay and pasture. It is also used as rangeland.

If this unit is used for hay and pasture, the main limitations are wetness and slight salinity of the soil. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Redrob soils is mainly alkali sacaton, basin wildrye, and alkali bluegrass. As the range condition deteriorates, inland saltgrass and greasewood increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 3,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 3,400 pounds in favorable years to 2,500 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of plant species is maintained in the plant community. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure. Production of vegetation suitable for livestock grazing is limited by the salinity and wetness of the soils.

This unit is well suited for stockwater ponds. Pits dug sufficiently deeper than the level of the water table can provide water for livestock. Due to the seepage potential of the soils, pits or other ponds will not hold water above the level of the water table for a long period of time. This unit is poorly suited for mechanical range renovation and range seeding; the main limitations are wetness and salinity of the soils. Use of equipment on this soil is limited to the period of the year when the water table is at its deepest level. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity of the soils.

The Redrob, frequently flooded soil is in capability subclass VIw, nonirrigated and irrigated. The Redrob soil is in capability subclass IVw, nonirrigated and irrigated. This unit is in the Saline Subirrigated, 10- to 14-inch precipitation, High Plains Southeast range site.

205—Redrob, frequently flooded-Redrob-Urban land complex, 0 to 3 percent slopes.

This map unit is on flood plains and low stream terraces. The native vegetation consists mainly of grass and grass-like plants. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 35 percent Redrob loam, frequently flooded; 25 percent Redrob very fine sandy loam; and 20 percent Urban land. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Gerrard loam, Glendive loam, and Grenoble gravelly sandy loam. Also included are small areas of Riverwash. Included areas make up about 20 percent of the total acreage.

The Redrob, frequently flooded soil is very deep and poorly drained. It formed in alluvium. Typically the surface layer is slightly saline dark grayish brown loam 14 inches thick. The upper part of the underlying material is slightly saline stratified brown loam and fine sandy loam 9 inches thick. The lower part to a depth of 60 inches or more is light yellowish brown very gravelly sand.

Permeability of the Redrob, frequently flooded soil is moderate in the upper part and very rapid in the lower part. Available water capacity is low. Effective rooting depth is 60 inches for water-tolerant plants, but it is only 5 to 18 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. From March through August, a seasonal high water table fluctuates between 0 and 1.5 feet. During the remainder of the year, the water table is between 1.5 and 3.5 feet. This soil is subject to brief, frequent flooding from May through June.

The Redrob soil is very deep and poorly drained. It formed in alluvium. Typically the upper part of the surface layer is slightly saline brown very fine sandy loam 5 inches thick. The next part is slightly saline very dark grayish brown loam 15 inches thick. The upper part of the underlying material is slightly saline brown loam 18 inches thick. The lower part to a depth of 60 inches or more is brownish yellow very gravelly loamy sand.

Permeability of the Redrob soil is moderate in the upper part and very rapid in the lower part. Available water capacity is moderate. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is only 12 to 24 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe. From March through August, the water table fluctuates between 1 and 2 feet. During the remainder of the year, the water table is between 1.5 and 3.5 feet. This soil is subject to a rare hazard of flooding.

Urban land is covered with buildings, streets, and parking lots. The original soil is either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Red fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

If this unit is used for urban development, the main limitations are the the high water table and the hazard of flooding. Due to the hazard of flooding, use of this unit as a site for buildings is not recommended. In addition, use of this soil as a site for buildings with basements is not recommended due to the high water table. Septic tank absorption fields buried in these soils do not function properly due the high water table. In addition, if several septic systems are installed in an area, the water added to the soil may raise the level of the water table.

The Redrob, frequently flooded soil is in capability subclass VIw, nonirrigated. The Redrob soil in in capability subclass IVw, nonirrigated.

206—Rentsac-Wycolo complex, 2 to 15 percent slopes.

This map unit is on cuesta dip slopes and structural benches. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,200 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Rentsac channery sandy loam, 2 to 15 percent slopes and 35 percent Wycolo sandy loam, 2 to 10 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Almy loam, Thermopolis fine sandy loam, and a soil similar to the Wycolo soil but which is 10 to 20 inches deep to bedrock. Also included are small areas of sandstone Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Rentsac soil is shallow and well drained. It formed in residuum derived dominantly from sandstone. Typically the surface is 20 percent covered with channery fragments and a few flagstones. The surface layer is yellowish brown channery sandy loam 3 inches thick. The subsoil is yellowish brown very channery sandy loam 3 inches thick. The substratum is brown extremely channery sandy loam 8 inches thick. Hard sandstone is at a depth of 14 inches. Depth to bedrock ranges from 10 to 20 inches. This soil is outside the characteristics of the

Rentsac series because it does not contain calcium carbonate. This difference, however, does not significantly affect the use or management of this soil.

Permeability of the Rentsac soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is medium. The hazard of wind erosion is moderate.

The Wycolo soil is moderately deep and well drained. It formed in alluvium derived dominantly from interbedded sandstone and shale. Typically the surface layer is strong brown sandy loam 7 inches thick. The subsoil is yellowish red sandy clay loam 9 inches thick. The substratum is pink sandy loam 7 inches thick. Weakly consolidated yellowish sandstone is at a depth of 23 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Wycolo soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used mainly as rangeland. It is also used for wildlife habitat and as a source of flagstones.

The potential plant community on the Rentsac soil is mainly bluebunch wheatgrass, bottlebrush squirreltail, and western wheatgrass. As the range condition deteriorates, black sagebrush and threadleaf sedge increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 450 pounds of air-dry vegetation per acre in normal years. Production ranges from 600 pounds in favorable years to 250 pounds in unfavorable years.

The potential plant community on the Wycolo soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing on the Rentsac soil is limited by the droughtiness of the soil and by the low annual precipitation; production on the Wycolo soil is moderately limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock. The Rentsac soil is poorly suited for mechanical range renovation and range seeding; the main limitations are the rock fragments in the surface layer and the hazards of wind and water erosion. The Wycolo soil is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazards of wind and water erosion. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. If practical, tillage should be along the contour of the slope.

The Rentsac soil is in capability subclass VIIs, nonirrigated. The Wycolo soil is in capability subclass IVe, nonirrigated. The Rentsac soil is in the Very Shallow, 10- to 14-inch precipitation, High Plains Southeast range site. The Wycolo soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch precipitation Southern Plains zone.

207—Renvers-Chalkhill complex, 1 to 15 percent slopes.

This map unit is on cuesta dip slopes. The native vegetation consists mainly of shrubs and grasses. Elevation is 7,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Renvers very stony loam, 3 to 15 percent slopes and 40 percent Chalkhill sandy loam, 1 to 15 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Blazon loam, Rentsac channery sandy loam, and Rock outcrop. Also included are areas of a moderately deep soil similar to the Chalkhill soil. Included areas make up about 20 percent of the total acreage.

The Renvers soil is very shallow and well drained. It formed in alluvium and residuum derived from sandstone. Typically the surface is 35 percent covered with stones and cobbles and 15 percent covered with gravel. The surface layer is pale brown very stony loam 1 inch thick. The underlying material is brown very stony fine sandy loam 3 inches thick. Hard sandstone is at a depth of 4 inches. Depth to bedrock ranges from 4 to 10 inches.

Permeability of the Renvers soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 4 to 10 inches. Runoff is medium and the hazard

of water erosion is moderate. The hazard of wind erosion is slight.

The Chalkhill soil is shallow and well drained. It formed in alluvium overlying residuum derived from sandstone. Typically the surface is 30 percent covered with sandstone channery fragments. The surface layer is light yellowish brown sandy loam 2 inches thick. The upper part of the subsoil is brown sandy clay loam 9 inches thick. The lower part is brown extremely channery sandy clay loam 3 inches thick. Hard sandstone is at a depth of 14 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Chalkhill soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Renvers soil is mainly bluebunch wheatgrass, western wheatgrass, and bottlebrush squirreltail. As the range condition deteriorates, black sagebrush and threadleaf sedge increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 450 pounds of air-dry vegetation per acre in normal years. Production ranges from 600 pounds in favorable years to 250 pounds in unfavorable years.

The potential plant community on the Chalkhill soil is mainly bluebunch wheatgrass, western wheatgrass, needleandthread, and black sagebrush. As the range condition deteriorates, threadleaf sedge and sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils and by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock. It is poorly suited for mechanical range renovation and range seeding. The main limitations are the rock fragments on the surface of the soil, droughtiness of the soil, and the hazards of wind and water erosion.

This unit is in capability subclass VIIs, nonirrigated. The Renvers soil is in the Very Shallow, 10- to 14-inch precipitation, High Plains Southeast range site. The Chalkhill soil is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

208—Rimton-Passcreek, cobbly subsoil-Miracle complex, 10 to 60 percent slopes.

This map unit is on north facing mountain slopes and canyon sides. The native vegetation consists mainly of trees, shrubs, and grasses. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 40 percent Rimton very fine sandy loam, 10 to 60 percent slopes; 25 percent Passcreek fine sandy loam, cobbly subsoil, 10 to 60 percent slopes; and 15 percent Miracle fine sandy loam, 10 to 40 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Cheadle sandy loam and Nathale gravelly fine sandy loam. Also included are small areas of limestone Rock outcrop and a coarse textured soil similar to the Rimton soil. Included areas make up about 20 percent of the total acreage.

The Rimton soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from interbedded limestone and sandstone. Typically the surface is covered with a 2-inch-thick mat of needles, twigs, and bark. The surface layer is very dark gray very fine sandy loam 4 inches thick. The subsurface layer is yellowish brown fine sandy loam 11 inches thick. The upper 9 inches of the subsoil are strong brown sandy clay loam. The next 8 inches are yellowish red sandy clay loam. The lower part is yellowish red very cobbly fine sandy loam 7 inches thick. Interbedded fractured sandstone and limestone are at a depth of 39 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Rimton soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

The Passcreek soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from interbedded limestone and sandstone. Typically the surface is 5 to 10 percent covered with cobbles. The surface layer is brown fine sandy loam 7 inches thick. The upper part of the subsoil is strong brown cobbly fine sandy loam 10 inches thick. The lower part is strong brown very cobbly fine sandy loam 9 inches thick. Hard limestone is at a depth of 26 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Passcreek soil is moderate. Available water capacity is very low. Effective rooting depth is only 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

The Miracle soil is moderately deep and well drained. It formed in residuum and colluvium derived dominantly from sandstone and shale. Typically the surface layer is brown fine sandy loam 6 inches thick. The upper 5 inches of the subsoil are brown sandy clay loam. The next part is strong brown sandy clay loam 15 inches thick. The lower part is yellowish red sandy clay loam 5 inches thick. Hard reddish sandstone is at a depth of 31 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Miracle soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

Most areas of this unit are used for wildlife habitat and recreation. A few areas are used as rangeland.

The present plant community on the Rimton soil is mainly Douglas-fir and a understory of spike fescue, mountain brome, Idaho fescue, elk sedge, currant, Rocky Mountain maple, yarrow, wheatgrasses, Columbia needlegrass, bedstraw, bluegrasses, lupine, heartleaf arnica, bluebells, strawberry, Woods rose, cinquefoil, and creeping juniper. A few areas have a plant community of limber pine and an understory of common juniper, bluebunch wheatgrass, and snowberry.

The potential plant community on the Passcreek soil is mainly bluebunch wheatgrass, Griffith wheatgrass, and Parry danthonia. As the range condition deteriorates, Sandberg bluegrass, prairie junegrass, and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Miracle soil is mainly bluebunch wheatgrass, prairie junegrass, Griffith wheatgrass, and Idaho fescue. As the range condition deteriorates, blue grama, threadleaf sedge, and big sagebrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 1,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 2,000 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of preferred species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing on the Passcreek soil is limited by the droughtiness of the soil; the Miracle soil is well suited to this production.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Rimton soil is poorly suited to the production of Douglas-fir for timber harvesting. Production of the Douglas-fir is 15 to 25 cubic feet per acre per year. Use of this soil for timber production and harvesting is limited because of the steepness of slope and the very slow growth of the trees.

This unit is in capability subclass VIIe, nonirrigated. The Rimton soil is in the Douglas-fir woodland site. The Passcreek soil is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast. The Miracle soil is in the Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

209—Riverwash.

This unit consists of areas of sandy and gravelly sediments that are frequently flooded and worked by rivers. This unit occurs on flood plains and in stream channel areas where river velocities are relatively rapid. Vegetation is usually absent; however, willows, annual forbs, and small cottonwoods grow on the more stable positions. Slope is 0 to 2 percent. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

These areas have a water table that is at or near the surface during and shortly after periods of flooding. In most areas, the water table is always above a depth of 3.5 feet.

Included in this unit are small areas of Canburn loam, Cantle loam, Gerrard loam, Glendive sandy loam, Grenoble gravelly sandy loam, Redrob loam, and frequently flooded Redrob loam. These included soils occur on the more stable areas of the unit. The size of included areas are so small, and occur in such a complex arrangement, that it was not practical to map them separately at the scale used. Included areas make up about 40 percent of the total acreage.

This unit is used mainly for wildlife habitat and for recreation.

This unit is capability class VIII.

210—Rock outcrop-Bonjea complex, 40 to 60 percent slopes.

This map unit is on mountain slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Rock outcrop and 30 percent Bonjea sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Boyle gravelly sandy loam, Chugcreek sandy loam, Lininger loam, and a very shallow soil similar to the Cathedral soil. Included areas make up about 20 percent of the total acreage.

Rock outcrop consists of exposures of granite and gneiss.

The Bonjea soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite and gneiss. Typically the surface layer is brown sandy loam 3 inches thick. The upper 10 inches of the subsoil are brown sandy clay loam. The lower 4 inches are dark yellowish brown gravelly sandy clay loam. Hard granite is at a depth of 17 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Bonjea soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

This unit is used mainly for wildlife habitat.

The potential plant community on this unit is mainly bluebunch wheatgrass, threetip sagebrush, and slimstem muhly. As the range condition deteriorates, threadleaf sedge and low rabbitbrush increase. As the range condition further deteriorates, broom snakeweed and annuals invade. The potential plant community produces about 550 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the Bonjea soil and by the amount of Rock outcrop in the unit. Steepness of the slope severely limits access to this unit by livestock.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

Rock outcrop is in capability subclass VIIIs. The Bonjea soil is in capability subclass VIIe, nonirrigated. The Bonjea soil is in the Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

211—Rock outcrop-Bruja-Byrnie complex, 30 to 70 percent slopes.

This map unit is on escarpments. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 30 percent Rock outcrop; 25 percent Bruja very cobbly fine sandy loam, 30 to 50 percent slopes; and 25 percent Byrnie gravelly fine sandy loam, 40 to 70 percent slopes. The Bruja soil is on lower slopes and in concave areas. The Byrnie soil is on steeper slopes. The components of this unit are so intricately intermingled that is was not practical to map them separately at the scale used.

Included in this unit are small areas of Canwall fine sandy loam, Joemre fine sandy loam, and Pilotpeak cobbly very fine sandy loam. Also included are small areas with a 1- or 2-inch-thick mantle of very channery sandy loam over bedrock. Included areas make up about 20 percent of the total acreage.

Rock outcrop consists of exposures of limestone, red sandstone, and shale.

The Bruja soil is moderately deep and well drained. It formed in residuum and colluvium derived from interbedded sandstone and limestone. Typically the surface is 70 percent covered with cobbles. The surface layer is dark yellowish brown very cobbly fine sandy loam 2 inches thick. The upper part of the subsoil is yellowish brown very cobbly very fine sandy loam 8 inches thick. The lower part is brown and light reddish brown very cobbly very fine sandy loam 13 inches thick. Fractured sandstone is at a depth of 23 inches. Depth to bedrock ranges from 20 to 40 inches. The lower part of the subsoil contains a high amount of calcium carbonate.

Permeability of the Bruja soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 20 to 40 inches for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

The Byrnie soil is shallow and well drained. It formed in residuum and colluvium derived from interbedded sandstone and limestone. Typically the surface is about 25 percent covered with gravel and cobbles. The surface layer is strong brown gravelly fine sandy loam 2 inches thick. The subsoil is light brown and strong brown gravelly fine sandy loam 10 inches thick. Weakly consolidated interbedded sandstone, limestone, and shale is at a

depth of 12 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Byrnie soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Bruja soil is mainly bluebunch wheatgrass, western wheatgrass, needleandthread, and mountainmahogany. As the range condition deteriorates, threadleaf sedge, rabbitbrush, and shorter grass species increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 600 pounds of air-dry vegetation per acre in normal years. Production ranges from 800 pounds in favorable years to 350 pounds in unfavorable years.

The potential plant community on the Byrnie soil is mainly bluebunch wheatgrass, Indian ricegrass, threadleaf sedge, mutton bluegrass, and needleandthread. As the range condition deteriorates, shorter species of grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the Byrnie soil and by the amount of Rock outcrop in the unit. Steepness of the slope severely limits access by livestock to this unit.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

Rock outcrop is in capability subclass VIIIs. The Bruja and Byrnie soils are in capability subclass VIIe, nonirrigated. The Bruja soil is in the Rocky Hills, 10- to 14-inch precipitation, High Plains Southeast range site. The Byrnie soil is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

212—Rock outcrop-Cathedral complex, 20 to 40 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses, shrubs, and a few widely scattered trees. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Rock outcrop and 30 percent Cathedral very stony coarse sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Alderon gravelly sandy loam, Boyle gravelly sandy loam, and Lininger loam. Included areas make up about 20 percent of the total acreage.

Rock outcrop consists of exposures of highly weathered granite saprolite and nearly vertical hard granitic blocks.

The Cathedral soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is about 70 percent covered with gravel, cobbles, stones, and boulders. The surface layer is dark grayish brown very stony coarse sandy loam 2 inches thick. The underlying material is dark brown very gravelly coarse sandy loam 11 inches thick. Hard granite is at a depth of 13 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Cathedral soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight. Winter winds remove the snow from the surface of this soil.

This unit is used mainly for wildlife habitat and for recreation. A few areas are used for livestock grazing.

The potential plant community on the Cathedral soil is mainly bluebunch wheatgrass, black sagebrush, threetip sagebrush, and slimstem muhly. As the range condition deteriorates, threadleaf sedge and low rabbitbrush increase. As the range condition further deteriorates, broom snakeweed and annuals invade. The potential plant community produces about 550 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years. Production of vegetation suitable for

livestock grazing is limited by the droughtiness of the Cathedral soil and by the amount of Rock outcrop in the unit. Steepness of the slope limits access by livestock to this unit.

Rock outcrop is in capability subclass VIIIs. The Cathedral soil is in capability subclass VIIe, nonirrigated. The Cathedral soil is in the Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

213—Rock outcrop-Cathedral-Alderon complex, 25 to 50 percent slopes.

This map unit is on mountain slopes. The native vegetation consists mainly of grasses, shrubs, and trees. Elevation is 6,000 to 7,800 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Rock outcrop; 20 percent Cathedral very gravelly sandy loam, 25 to 40 percent slopes; and 20 percent Alderon sandy loam, 25 to 50 percent slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Boyle gravelly sandy loam and Lininger loam. Included areas make up about 20 percent of the total acreage.

Rock outcrop consists of exposures of hard granite and highly weathered granite saprolite. It includes very large granite boulders.

The Cathedral soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is 50 percent covered with small granitic gravel. The surface layer is dark brown very gravelly sandy loam 2 inches thick. The underlying material is dark brown very gravelly coarse sandy loam 8 inches thick. Hard granite is at a depth of 10 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Cathedral soil is rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight. Winter winds remove the snow from the surface of this soil.

The Alderon soil is moderately deep and well drained. It formed in colluvium and residuum derived dominantly from granite. Typically the surface is covered with a 2-inch-thick mat of needles, twigs, and bark. The surface layer is very dark grayish brown sandy loam 2 inches thick. The subsurface layer is light brown sandy clay loam 5 inches thick. The subsoil is yellowish red gravelly sandy clay loam 19 inches thick. The substratum is brown very gravelly coarse sandy loam 13 inches thick. Weakly consolidated granite is at a depth of 39 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Alderon soil is moderate. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

Most areas of this unit are used for wildlife habitat. A few areas are also used as rangeland.

The potential plant community on the Cathedral soil is mainly bluebunch wheatgrass, black sagebrush, threetip sagebrush, and slimstem muhly. As the range condition deteriorates, threadleaf sedge and low rabbitbrush increase. As the range condition further deteriorates, broom snakeweed and annuals invade. The potential plant community produces about 550 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years.

The present vegetation on the Alderon soil is lodgepole pine and an understory of king spike fescue, elk sedge, low sedge, heartleaf arnica, Rocky Mountain maple, creeping juniper, currant, snowberry, antelope bitterbrush, mountain brome, bluebells, western yarrow, kinnikinnick, rose pussytoes, Richardson's geranium, bedstraw, and Woods rose.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Slope limits access by livestock to this unit. Grazing also should be managed to protect the unit from excessive erosion.

Production of vegetation suitable for livestock grazing is limited by the droughtiness of the Cathedral soil; by the dense tree cover on the Alderon soil, which limits the growth of the understory vegetation; and by the amount of Rock outcrop in the unit. This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Alderon soil is moderately suited to the production of lodgepole pine for timber harvesting. Production of lodgepole pine is 25 to 35 cubic feet per acre per year. The site index for lodgepole pine ranges from 35 to 60. Use of this soil for timber production and harvesting is limited because of the steepness of slope and the slow growth of the trees.

Rock outcrop is in capability subclass VIIIs. The Cathedral and Alderon soils are in capability subclass VIIe, nonirrigated. The Cathedral soil is in the Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Alderon soil is in a woodland site.

214—Rock outcrop-Pilotpeak complex, 3 to 25 percent slopes.

This map unit is on cuesta dip slopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Rock outcrop and 25 percent Pilotpeak cobbly fine sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Bruja very cobbly fine sandy loam, Canwall fine sandy loam, and a soil similar to the Pilotpeak soil but which contains seams of gypsum. Included areas make up about 25 percent of the total acreage.

Rock outcrop consists of exposures of fractured limestone bedrock.

The Pilotpeak soil is very shallow or shallow and well drained. It formed in residuum and colluvium derived dominantly from limestone. Typically the surface is 20 percent covered with cobbles and gravel. The surface layer is brown cobbly fine sandy loam 4 inches thick. The subsoil is brown very cobbly very fine sandy loam 7 inches thick. Hard limestone is at a depth of 11 inches. Depth to bedrock ranges from 7 to 20 inches.

Permeability of the Pilotpeak soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 7 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate. Winter winds remove the snow from the surface of this soil.

This unit is used for wildlife habitat and as rangeland.

The potential plant community on the Pilotpeak soil is mainly bluebunch wheatgrass, western wheatgrass, bottlebrush squirreltail, black sagebrush, and antelope bitterbrush. As the range condition deteriorates, juniper, black sagebrush, and threadleaf sedge increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 450 pounds of air-dry vegetation per acre in normal years. Production ranges from 600 pounds in favorable years to 250 pounds in unfavorable years.

Production of vegetation suitable for livestock grazing is limited by the droughtiness of the Pilotpeak soil and by the amount of Rock outcrop in this unit. This unit is poorly suited for stockwater ponds, mechanical range renovation, or range seeding due to the amount of Rock outcrop in the unit, the cobbles in the surface layer, and the depth to bedrock in the Pilotpeak soil.

Rock outcrop is in capability subclass VIIIs. The Pilotpeak soil is in capability subclass VIIe, nonirrigated. The Pilotpeak soil is in the Very Shallow, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in a similar range site in the 15- to 17-inch precipitation Southern Plains zone.

215—Rock outcrop-Rogert complex, 25 to 99 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses, shrubs, and a few scattered trees. Elevation is 7,600 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 60 percent Rock outcrop and 20 percent Rogert gravelly fine sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Lakehelen fine sandy loam, Amesmont fine sandy loam, Hapjack gravelly sandy loam, Poin sandy loam, and a very shallow soil similar to the Rogert soil. Included areas make up about 20 percent of the total acreage.

Rock outcrop consists of exposures of hard granite and highly weathered granite saprolite.

The Rogert soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is 25 percent covered with cobbles and small granitic gravel. The surface layer is dark brown gravelly fine sandy loam 4 inches thick. The subsoil is brown very gravelly sandy loam 7 inches thick. Hard granite is at a depth of 11 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Rogert soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate. Winter winds remove the snow from the surface of this soil.

This unit is used mainly for wildlife habitat. It is also used for recreation and for limited livestock grazing.

The potential plant community on the Rogert soil is mainly bluebunch wheatgrass, threetip sagebrush, black sagebrush, and slimstem muhly. As the range condition deteriorates, threadleaf sedge and low rabbitbrush increase. As the range condition further deteriorates, broom snakeweed and annuals invade. The potential plant community produces about 550 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less

preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the amount of Rock outcrop in this unit and by the droughtiness of the Rogert soil. Steepness of the slope severely limits access by livestock to many areas of this unit.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

Rock outcrop is in capability subclass VIIIs. The Rogert soil is in capability subclass VIIe, nonirrigated. The Rogert soil is in the Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

216—Rock River sandy loam, 2 to 6 percent slopes.

This very deep, well drained soil is on alluvial fans and terraces. It formed in alluvium. The native vegetation consists mainly of grasses. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Alcova sandy loam, Forelle loam, and Stunner sandy loam. Also included are small areas of Borollic Camborthids soils. Included areas make up about 20 percent of the total acreage.

Typically the surface layer is pale brown sandy loam 3 inches thick. The upper part of the subsoil is yellowish brown and brown sandy clay loam 14 inches thick. The lower part is brown fine sandy loam to a depth of 60 inches or more.

Permeability of the Rock River soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat. A few areas near Laramie and Rock River are used for irrigated hay and pasture.

The potential plant community on the Rock River soil is western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may needed in areas where there is more brush than would be present in the potential plant community. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is is well suited to irrigated hay and pasture. To avoid overirrigating and leaching of plant nutrients, applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs. Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

This unit is in capability subclass IVe, nonirrigated and irrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

217—Rock River loam, 1 to 8 percent slopes, bouldery.

This very deep, well drained soil is on alluvial fan aprons. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Twocabin gravelly loam, Forelle loam, and Cushool sandy loam. Included areas make up about 20 percent of the total acreage.

Typically the surface is about 1 percent covered with boulders and about 5 percent covered with gravel. The surface layer is yellowish brown loam 3 inches thick. The upper part of the subsoil is brown sandy clay loam 18 inches thick. The lower part is pale yellow sandy loam to a depth of 60 inches or more.

Permeability of the Rock River soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Rock River soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is poorly suited for mechanical range renovation and range seeding due to the boulders on the surface of the soil. Brush control may needed in areas where there is more brush than would be present in the potential plant community; prescribed burning or aerial application of herbicides would be good methods of brush control.

This unit is in capability subclass IVe, nonirrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

218—Rock River-Urban land complex, 0 to 6 percent slopes.

This map unit is on alluvial and strath terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 55 percent Rock River sandy loam and 25 percent Urban land. The components of this unit are so intricately intermingled that is was not practical to map them separately at the scale used.

Included in this unit are small areas of Alcova sandy loam, Forelle loam, and Stunner sandy loam. Also included are small areas of Borollic Camborthids soils. Included areas make up about 20 percent of the total acreage.

The Rock River soil is very deep and well drained. It formed in alluvium. Typically the surface layer is pale brown sandy loam 3 inches thick. The upper part of the subsoil is yellowish brown sandy clay loam 14 inches thick. The lower part is brown fine sandy loam to a depth of 60 inches or more.

Permeability of the Rock River soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

Urban land is covered with buildings, streets, and parking lots. The original soil is either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Red fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

This unit is well suited to urban development. It has few limitations.

The Rock River soil is in capability subclass IVe, nonirrigated.

219—Rogert-Lakehelen-Rock outcrop complex, 8 to 40 percent slopes.

This map unit is on mountain slopes. The native vegetation consists mainly of grasses, shrubs, and trees. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 30 percent Rogert gravelly sandy loam, 8 to 25 percent slopes; 30 percent Lakehelen sandy loam, 8 to 40 percent slopes; and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Amesmont fine sandy loam, Hapjack gravelly sandy loam, Vensora very fine sandy loam, and a very shallow soil similar to the Rogert soil. Included areas make up about 20 percent of the total acreage.

The Rogert soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is 20 percent covered with small granitic gravel. The surface layer is dark brown gravelly sandy loam 3 inches thick. The subsoil is dark brown very gravelly sandy loam 8 inches thick. The substratum is brown very gravelly sandy loam 5 inches thick. Hard granite is at a depth of 16 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Rogert soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is

moderate. Winter winds remove the snow from the surface of this soil.

The Lakehelen soil is moderately deep and well drained. It formed in colluvium and residuum derived from granite. Typically the surface is covered with a 1-inch-thick mat of needles and twigs. The surface layer is brown and light yellowish brown sandy loam 15 inches thick. The subsoil is dark yellowish brown very gravelly sandy clay loam 12 inches thick. Hard granite is at a depth of 27 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Lakehelen soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

Rock outcrop consists of exposures of hard granite and highly weathered granite saprolite.

This unit is used mainly as rangeland and for wildlife habitat. It is also used for recreation and for limited harvesting of wood products.

The potential plant community on the Rogert soil is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

The present vegetation on the Lakehelen soil is lodgepole pine or Douglas-fir and an understory of elk sedge, king spike fescue, bluegrasses, kinnikinnick, creeping juniper, aspen, heartleaf arnica, prairie thermopsis, penstemon, geranium, rose pussytoes, Oregongrape, western yarrow, Idaho fescue, Columbia needlegrass, cinquefoil, stonecrop, and larkspur.

Production of vegetation on the Rogert soil suitable for livestock grazing is limited by the droughtiness of the soil. Production on the Lakehelen soil is limited by the dense tree cover, which limits the growth of the understory vegetation.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Lakehelen soil is moderately suited to the production of lodgepole pine or Douglas-fir for timber harvesting. Production of lodgepole pine is 25 to 35 cubic feet per acre per year. Production of Douglas-fir is 20 to 30 cubic feet per acre per year. Use of this soil for timber production and harvesting is limited because of the steepness of slope and the slow growth of the trees.

The Rogert soil is in capability subclass VIIe, nonirrigated. The Lakehelen soil is in capability subclass VIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Rogert soil is in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Lakehelen soil is in a woodland site.

220—Rogert-Rock outcrop-Amesmont complex, 5 to 25 percent slopes.

This map unit is on foothills and mountain slopes. The native vegetation consists mainly of grasses, shrubs, and a few scattered trees. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 45 percent Rogert gravelly sandy loam, 5 to 25 percent slopes; 25 percent Rock outcrop; and 15 percent Amesmont sandy loam, 5 to 15 percent slopes. The Rogert soils are on the convex slopes and the Amesmont soils are on concave slopes. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Dalecreek sandy loam, Lakehelen sandy loam, a soil similar to the Amesmont soil, but with a less pronounced subsoil, and a very shallow soil similar to the Rogert soil. Included areas make up about 15 percent of the total acreage.

The Rogert soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from granite. Typically the surface is 50 percent covered with small granitic gravel. The surface layer is brown gravelly sandy loam 4 inches thick. The subsoil is dark brown very gravelly sandy loam 7 inches thick. The substratum is dark brown very gravelly sandy loam 3 inches thick. Hard granite is at a depth of 14 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Rogert soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

Rock outcrop consists of exposures of hard granite and highly weathered granite saprolite.

The Amesmont soil is moderately deep and well drained. It formed in colluvium and alluvium derived dominantly from granite. Typically the surface is 20 percent covered with fine gravel. The surface layer is

brown sandy loam 4 inches thick. The upper part of the subsoil is brown gravelly sandy clay loam 14 inches thick. The lower 6 inches are yellowish brown very gravelly sandy loam. The substratum is strong brown very gravelly loamy sand 12 inches thick. Weakly consolidated granite is at a depth of 36 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Amesmont soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe. Winter winds deposit additional snow on this soil.

This unit is used as rangeland, for wildlife habitat, and for recreation.

The potential plant community on the Rogert and Amesmont soils is mainly bluebunch wheatgrass, slimstem muhly, and threetip sagebrush. As the range condition deteriorates, threadleaf sedge, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds due to the depth to bedrock and the steepness of slope. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the rock fragments on the surface of the soils, the hazard of water erosion, and the amount of Rock outcrop in the unit.

The Rogert soil is in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Amesmont soil is in capability subclass VIe, nonirrigated. The Rogert and Amesmont soils are in the Shallow Igneous, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

221—Rohonda fine sandy loam, 3 to 6 percent slopes.

This moderately deep, well drained soil is on strath terraces and structural benches. It formed in residuum derived from interbedded sandstone, limestone, and shale. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Joemre fine sandy loam, Thermopolis fine sandy loam, and Wycolo sandy loam. Included areas make up about 20 percent of the total acreage.

Typically the surface layer is brown fine sandy loam 3 inches thick. The upper part of the subsoil is strong brown sandy loam about 12 inches thick. The lower part is reddish yellow sandy loam 16 inches thick. Fractured reddish sandstone is at a depth of 31 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Rohonda soil is moderately rapid. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Rohonda soil is needleandthread, thickspike wheatgrass, Indian ricegrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, sagebrush, rabbitbrush, and forbs increase. As the range condition further deteriorates, annuals, forbs, and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the depth to bedrock and the potential for seepage. It is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass IVe, nonirrigated. It is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

222—Rohonda-Tieside complex, 3 to 10 percent slopes.

This map unit is on structural benches, strath terraces, and hillslopes. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Rohonda fine sandy loam and 35 percent Tieside gravelly sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Joemre fine sandy loam, Pilotpeak cobbly fine sandy loam, and Wycolo sandy loam. Also included are small Rock outcrops of limestone and sandstone. Included areas make up about 15 percent of the total acreage.

The Rohonda soil is moderately deep and well drained. It formed in alluvium and residuum derived dominantly from interbedded sandstone and limestone. Typically the surface layer is reddish brown fine sandy loam 6 inches thick. The upper part of the subsoil is reddish brown fine sandy loam 15 inches thick. The lower part is light red fine sandy loam 17 inches thick. Weakly consolidated sandstone is at a depth of 38 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Rohonda soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Tieside soil is shallow and well drained. It formed in weathered materials derived dominantly from interbedded sandstone, shale, and limestone. Typically the surface layer is reddish brown gravelly sandy loam 5 inches thick. The upper 5 inches of the subsoil are reddish brown sandy loam. The lower 3 inches are light reddish brown sandy loam. Weakly consolidated red sandstone is at a depth of 13 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Tieside soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Rohonda soil is needleandthread, thickspike wheatgrass, Indian ricegrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Tieside soil is mainly bluebunch wheatgrass, Indian ricegrass, mutton bluegrass, threadleaf sedge, and needleandthread. As the range condition deteriorates, shorter species of grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing on the Rohonda soil is moderately limited by the low annual precipitation. Production on the Tieside soil is limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds due to the depth to bedrock. It is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazards of wind and water erosion. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. If practical, tillage should be along the contour of the slope.

The Rohonda soil is in capability subclass IVe, nonirrigated. The Tieside soil is in capability subclass VIIs, nonirrigated. The Rohonda soil is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. The Tieside soil is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar

range sites in the 15- to 17-inch precipitation Southern Plains zone.

223—Rohonda-Cheadle-Rock outcrop association, 6 to 45 percent slopes.

This map unit is on ridges and escarpments and in adjacent swales. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 9,000 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 50 percent Rohonda fine sandy loam, 20 percent Cheadle very cobbly fine sandy loam, and 15 percent Rock outcrop. The Rohonda soil occurs on foot slopes of ridges and in swales with slopes of 6 to 15 percent. The Cheadle soil occurs on ridges and escarpments with slopes of 15 to 45 percent.

Included in this unit are small areas of Lymanson loam and a soil similar to the Rohonda soil, but with a darker surface layer or less clay in the subsoil. Also included are small areas of soils similar to the Cheadle soil, but with a lighter colored surface layer, redder colors, or weakly consolidated bedrock. Included areas make up about 15 percent of the total acreage.

The Rohonda soil is moderately deep and well drained. It formed in residuum and alluvium derived from sandstone. Typically the surface layer is reddish brown fine sandy loam 7 inches thick. The upper part of the subsoil is light brown very fine sandy loam 14 inches thick. The next part is pinkish gray fine sandy loam 3 inches thick. The lower part is light brown fine sandy loam 9 inches thick. Weakly consolidated fine-grained sandstone is at a depth of 33 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Rohonda soil is moderately rapid. Available water capacity is low. Effective rooting depth is 20 to 40 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

The Cheadle soil is shallow and well drained. It formed in residuum and colluvium derived from sandstone. Typically the surface is 10 percent covered with sandstone flags and 20 percent covered with sandstone cobbles. The surface layer is brown very cobbly fine sandy loam 7 inches thick. The underlying material is yellowish brown very cobbly loamy fine sand 5 inches thick. Hard brown sandstone is at a depth of 12 inches. Depth to bedrock ranges from 10 to 20 inches. This soil is outside the characteristics of the Cheadle series because it does not have a horizon which contains an accumulation of calcium carbonate. This difference, however, does not significantly affect the use or management of this soil.

Permeability of the Cheadle soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

Rock outcrop consists of exposures of hard sandstone.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Rohonda soil is mainly bluebunch wheatgrass, Parry danthonia, and Griffith wheatgrass. As the range condition deteriorates, bluegrasses, threetip sagebrush, and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

The potential plant community on the Cheadle soil is mainly bluebunch wheatgrass, spike fescue, and mountainmahogany. As the range condition deteriorates, threadleaf sedge and juniper increase. As the range condition further deteriorates, broom snakeweed, cheatgrass, and annual forbs invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,150 pounds in favorable years to 550 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope. The depth to bedrock is also a limitation to the development of stockwater ponds.

The Rohonda soil is in capability subclass IVe, nonirrigated. The Cheadle soil is in capability subclass VIIe, nonirrigated. The Rock outcrop is in capability subclass VIIIs. The Rohonda soil is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Cheadle soil is in the Rocky Hills, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

224—Ryark loamy sand, 1 to 6 percent slopes.

This very deep, well drained soil on is alluvial fans. It formed in eolian deposits derived from various sources. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Cushool sandy loam, Fiveoh sandy loam, Luhon loam, Rock River sandy loam, and a very deep soil similar to the Ryark soil, but which has a less pronounced subsoil. Also included is a soil similar to the Ryark soil, but which has limestone bedrock at a depth of 30 to 60 inches. Included areas make up about 15 percent of the total acreage.

Typically the surface layer is brown loamy sand 3 inches thick. The upper part of the subsoil is dark yellowish brown sandy loam 17 inches thick. The lower 16 inches are brown sandy loam. The substratum to a depth of 60 inches or more is light brown loamy sand. In some areas, the surface layer is sandy loam.

Permeability of the Ryark soil is moderately rapid. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on this unit is needleandthread, thickspike wheatgrass, Indian ricegrass, threadleaf sedge, and silver sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and cheatgrass invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is poorly suited for mechanical range renovation and moderately suited for range seeding. The main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. In addition, it may not be economically feasible due to the coarse texture of the surface layer. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass IVe, nonirrigated. It is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

225—Shirleybasin-Twocabin-Lahtida complex, 0 to 15 percent slopes.

This map unit is on dissected pediments to the Laramie Range. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 35 percent Shirleybasin loam, 0 to 6 percent slopes; 25 percent Twocabin gravelly loam, 6 to 15 percent slopes; and 25 percent Lahtida loam, 2 to 12 percent slopes. The Shirleybasin soil is on the foot slopes of pediment breaks and on broad pediment summits. The Twocabin soil is on the crest of interfluve ridges, pediment breaks, and convex knobs. The Lahtida soil is on the back slopes and foot slopes of the interfluve ridges and pediment breaks. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Chalkville loam, Rock River sandy loam, and Ryark loamy sand. Also included are very small areas of Rock outcrop. Included areas make up about 15 percent of the total acreage.

The Shirleybasin soil is very deep and well drained. It formed in alluvium and residuum derived dominantly from tuffaceous sedimentary rocks. Typically the surface layer is pale brown loam 2 inches thick. The upper part of the subsoil is brown sandy clay loam 6 inches thick. The next part is brown clay loam 19 inches thick. The next part to a depth of 52 inches are white clay loam. The lower part is light gray gravelly sandy clay loam to a depth of 60 inches or more.

Permeability of the Shirleybasin soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Twocabin soil is very deep and well drained. It formed in alluvium overlying residuum derived from interbedded tuff, shale, and claystone. The surface layer is pale brown gravelly loam 4 inches thick. The upper part of the subsoil is brown very gravelly sandy clay loam 7 inches thick. The next 9 inches are very pale brown very gravelly loam. The lower part is white and very pale brown loam to a depth of 60 inches or more. The lower subsoil layer has a high amount of calcium carbonate.

Permeability of the Twocabin soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more for some plants; for others it is only 20 to 40 inches because the high content of calcium carbonate restricts root growth. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight.

The Lahtida soil is moderately deep and well drained. It formed in alluvium overlying residuum derived from tuffaceous claystone. Typically the surface is 25 percent covered with gravel and cobbles. The surface layer is pale brown loam 2 inches thick. The upper part of the subsoil is yellowish brown clay loam 13 inches thick. The lower part is yellowish brown loam 13 inches thick. Weakly consolidated claystone is at a depth of 28 inches. Depth to bedrock ranges from 20 to 40 inches.

Permeability of the Lahtida soil is slow. Available water capacity is moderate. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat. It is also used for recreation.

The potential plant community on the Shirleybasin and Lahtida soils is mainly western wheatgrass, needleandthread, bluebunch wheatgrass, and big sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Twocabin soil is mainly bluebunch wheatgrass, western wheatgrass, needleandthread, mutton bluegrass, and black sagebrush. As the range condition deteriorates, threadleaf sedge and blue grama increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion.

Production of vegetation suitable for livestock grazing on the Shirleybasin and Lahtida soils is moderately limited by the low annual precipitation. Production on the Twocabin soil is limited by the low annual precipitation and by the high content of calcium carbonate in the lower subsoil layers, which restrict root growth.

The Shirleybasin and Twocabin soils are moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. The Lahtida soil is poorly suited for stockwater ponds due to the depth to bedrock and the steepness of slope.

This unit is moderately suited for mechanical range renovation and range seeding; the main limitations are the hazard of water erosion, and the gravel on and in the surface layer of the soils. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of water erosion. Tillage should be along the contour of the slope.

This unit is in capability subclass IVe, nonirrigated. The Shirleybasin and Lahtida soils are in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Twocabin soil is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

226—Silas loam, 1 to 6 percent slopes.

This very deep, somewhat poorly drained soil is on outwash terraces. It formed in alluvium derived dominantly from granite sources. The native vegetation consists mainly of grasses and sedges. Elevation is 7,800 to 8,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

Included in this unit are many small areas of Borollic Cambothids soils. They are on mounds about 10 feet by 25 feet in size, with the long dimension parallel to the slope. Also included are small areas of Greyback very cobbly sandy loam and Vensora loam. Included areas make up about 25 percent of the total acreage.

Typically the upper 22 inches of the surface layer is gray loam. The next 10 inches are dark gray gravelly clay loam. The underlying material is light gray loam to a depth of 60 inches or more.

Permeability of the Silas soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more for plants that tolerate a water table, but it is 30 to 54 inches for plants that cannot. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table fluctuates between depths of 2.5 and 4.5 feet from April through July. This soil is subject to a rare hazard of flooding.

This unit is used mainly for irrigated hay and pasture. It is also used as rangeland.

If this unit is used for hay and pasture, the main limitation is the presence of many very gravelly mounds. In addition, the short growing season limits the types of hay that can be grown. Due to the droughtiness of the soil, these mounds are less productive than the surrounding areas of Silas soil. If the flood irrigation method is used, distribution of irrigation water will be difficult due to the undulating terrain. Use of sprinklers for irrigation will result in a more efficient use and more even distribution of the irrigation water, but may not be economically feasible.

Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Silas soil is mainly basin wildrye, slender wheatgrass, western wheatgrass, and tufted hairgrass. As the range condition deteriorates, sedges and willows increase. As the range condition further deteriorates, Kentucky bluegrass and annuals invade. The potential plant community produces about 4,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 4,500 pounds in favorable years to 3,300 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. This unit is well suited to the production of vegetation suitable for livestock grazing. The wetness of the soil, however, influences the types of plants available for livestock grazing. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure.

This soil is well suited for stockwater ponds. Pits dug sufficiently deeper than the level of the water table can provide water for livestock during the period when the water table is at its highest level. This soil is well suited for mechanical range renovation and range seeding.

This unit is in capability subclass VIw, nonirrigated and irrigated. It is in the Subirrigated, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

227—Silas, gravelly substratum-Vensora loams, 0 to 6 percent slopes.

This map unit is in mountain valleys. The native vegetation consists mainly of grasses, grass-like plants, and shrubs. Elevation is 7,800 to 9,500 feet. The annual precipitation is 15 to 19 inches. The annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

This unit is 55 percent Silas loam, gravelly substratum, 1 to 6 percent slopes; and 25 percent Vensora loam, 0 to 3 percent slopes. The Silas, gravelly substratum soil is on the edges of the valleys. The Vensora soil is in the center of the valleys. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Amesmont fine sandy loam, Cryaquolls soil, and sand and gravel deposits. Included areas make up about 20 percent of the total acreage.

The Silas soil is very deep and somewhat poorly drained. It formed in alluvium derived dominantly from granite. Typically the surface layer is dark grayish brown loam 22 inches thick. The upper part of the underlying material is yellowish brown gravelly sandy clay loam 20 inches thick. The lower part to a depth of 60 inches or more is yellowish brown very gravelly sandy loam stratified with layers of gravelly loamy sand.

Permeability of the Silas soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is only 30 to 54 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table fluctuates between depth of 2.5 and 4.5 feet from April through July.

The Vensora soil is very deep and poorly drained. It formed in alluvium derived dominantly from granite. Typically the upper part of the surface layer is very dark grayish brown loam 7 inches thick. The lower part is dark

gray loam 10 inches thick. The upper part of the underlying material is brown loam 13 inches thick. The lower part to a depth of 60 inches or more is yellowish brown very gravelly sandy clay loam stratified with thin layers of sandy loam and loam.

Permeability of the Vensora soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more for water-tolerant plants, but it is only 6 to 30 inches for plants that cannot tolerate a water table. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate. A seasonal high water table is at a depth of 0.5 to 2.5 feet from April through July. This soil is subject to a rare hazard of flooding.

This map unit is used for irrigated hay, as rangeland, and for wildlife habitat.

If this unit is used for hay and pasture, the main limitation is the wetness of the soils. In addition, the short growing season limits the types of hay that can be grown. Applications of irrigation water will require careful planning. Due to the high water table, proper application of irrigation water is necessary to avoid saturation. If the upper layers of this soil are saturated for long periods of time, sedges and rushes will become the dominant plants and other yields will be significantly lower. To avoid overirrigating, irrigation water should be applied only if the soil moisture in the rooting zone is less than 75 percent. Applications of irrigation water should be adjusted to the available water capacity of the soil and to the crop needs.

Fertilizer is needed to ensure optimum growth of grasses and legumes, and should be applied according to soil tests. Grazing when the soil is wet results in compaction of the surface layer, poor tilth, and excessive runoff.

The potential plant community on the Silas soil is mainly basin wildrye, slender wheatgrass, western wheatgrass, and tufted hairgrass. As the range condition deteriorates, sedges and willows increase. As the range condition further deteriorates, Kentucky bluegrass and annuals invade. The potential plant community produces about 4,000 pounds of air-dry vegetation per acre in normal years. Production ranges from 4,500 pounds in favorable years to 3,300 pounds in unfavorable years.

The potential plant community on the Vensora soil is mainly tufted hairgrass, Nebraska sedge, slough sedge, and willows. As the range condition deteriorates, willows, sedges, and arrowgrass increase. As the range condition further deteriorates, annuals invade. The potential plant community produces about 5,500 pounds of air-dry vegetation per acre in normal years. Production ranges from 6,500 pounds in favorable years to 4,000 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Grazing should be deferred until the soil is firm and the more desirable forage plants have achieved sufficient growth to withstand grazing pressure.

The Silas soil is well suited to the production of vegetation suitable for livestock grazing. The wetness of the Silas soil, however, influences the types of plants available for livestock grazing. Production on the Vensora soil is limited by the wetness of the soil.

This unit is well suited for stockwater ponds. Pits dug sufficiently deeper than the level of the water table can provide water for livestock. Because the water table is at a more shallow depth in the Vensora soil, it is more suitable for pits than the Silas soil. The Silas soil is well suited for mechanical range renovation and range seeding. The Vensora soil is poorly suited for mechanical range renovation and range seeding; the main limitation is the wetness of the soil. Use of equipment on the Vensora soil is limited to the period of the year when the water table is at its deepest level. If range seedings are planned on the Vensora soil, plant species carefully selected because of the wetness of the soil.

This unit is in capability subclass VIw, irrigated and nonirrigated. The Silas soil is in the Subirrigated, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site. The Vensora soil is in the Wetland, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

228—Stunner sandy loam, 2 to 8 percent slopes.

This very deep, well drained soil is on fan terraces and in valleys. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the average frost-free period is 85 to 110 days.

Included in this unit are small areas of Forelle loam, Luhon loam, and Poposhia loam. Also included are small areas of Borollic Camborthids soils and playas that are intermittently ponded with water. Included areas make up about 40 percent of the total acreage.

Typically the surface layer is brown sandy loam 3 inches thick. The upper part of the subsoil is brown clay loam 9 inches thick. The next part is pale brown and very pale brown loam 14 inches thick. The lower part is pale brown sandy loam to a depth of 60 inches or more. The middle and lower subsoil layers contain a high amount of calcium carbonate.

Permeability of the Stunner soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more for some plants, but for others it is only 15 to 25 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Stunner soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush, rabbitbrush, and blue grama increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the low annual precipitation and by the high amount of calcium carbonate in the lower subsoil layers, which limits root growth.

This soil is poorly suited for stockwater ponds due to the potential for seepage losses. It is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass IVe, nonirrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

229—Stunner-Borollic Camborthids complex, 2 to 5 percent slopes.

This map unit is on fan terraces with a mound-intermound pattern of microrelief. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Stunner sandy loam and 40 percent Borollic Camborthids soil. The Stunner soils are in intermound areas. The Borollic Camborthids soil is on micromounds. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Alcova sandy loam, Forelle loam, Poposhia sandy loam, and Rock River sandy loam. Included areas make up about 20 percent of the total acreage.

The Stunner soil is very deep and well drained. It formed in alluvium. Typically the surface layer is pale brown sandy loam 3 inches thick. The upper 10 inches of the subsoil are brown loam. The next 12 inches are light gray loam. The lower part is pale brown loam to a depth of 60 inches or more. The middle and lower subsoil layers contain a high amount of calcium carbonate.

Permeability of the Stunner soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more for some plants, but for others it is 15 to 25 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Borollic Camborthids soil is very deep and well drained. It formed in alluvium modified by congeliturbation. These soils are highly variable from area to area; no single profile is typical. Commonly, the surface layer is light yellowish brown gravelly sandy loam or very gravelly sandy loam 1 inch thick. The upper part of the subsoil is commonly yellowish brown gravelly sandy loam or very gravelly sandy clay loam 9 inches thick. The lower part is commonly light yellowish brown gravelly sandy loam or very gravelly sandy loam 15 inches thick. The substratum is commonly light yellowish brown gravelly sandy loam or sandy loam to a depth of 60 inches or more.

Permeability of the Borollic Camborthids soil is moderate to moderately rapid. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is slight.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Stunner soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush, rabbitbrush, and blue grama increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Borollic Camborthids soil is mainly needleandthread, Indian ricegrass, thickspike wheatgrass, and spineless horsebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,200 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,500 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

Production of vegetation on the Stunner soil suitable for livestock grazing is limited by the low annual precipitation and by the high amount of calcium carbonate in the lower subsoil layers, which limits root growth. Production on the Borollic Camborthids soil is limited by the low annual precipitation and by the droughtiness of the soil.

The Stunner soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. The Borollic Camborthids soil is poorly suited for stockwater ponds due to the potential for seepage losses. The Stunner soil is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The Borollic Camborthids soil is poorly suited for mechanical range renovation and range seeding; the main limitations are the very gravelly surface layer and the droughtiness of the soil. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community. Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass IVe, nonirrigated. The Stunner soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Borollic Camborthids soil is in the Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

230—Stunner-Tisworth-Blazon complex, 1 to 6 percent slopes.

This map unit is on fan terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,950 to 7,200 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Stunner fine sandy loam, 2 to 6 percent slopes; 25 percent Tisworth sandy loam, 0 to 5 percent slopes; and 15 percent Blazon loam, 1 to 6 percent slopes. The Stunner and Tisworth soils are on convex and planar areas. The Blazon soil is on convex areas. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Bullock sandy loam, Forelle loam, and Rock River loam. Also included are small areas of a moderately deep soil similar to the Stunner soil. Included areas make up about 20 percent of the total acreage.

The Stunner soil is very deep and well drained. It formed in alluvium. Typically the surface is less than 5 percent covered with gravel. The surface layer is pale brown fine sandy loam 1 inch thick. The upper part of the subsoil is yellowish brown clay loam 9 inches thick. The next part is pale brown clay loam 22 inches thick. The lower part is light brownish gray and grayish brown sandy clay loam to a depth of 60 inches or more. The middle and lower subsoil layers contain a high amount of calcium carbonate.

Permeability of the Stunner soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Tisworth soil is very deep and well drained. It formed in alluvium. Typically the surface layer is pale brown sandy loam 4 inches thick. The upper part of the subsoil is pale brown sandy clay loam 3 inches thick. The next part is light yellowish brown clay loam 12 inches thick. The lower part is light yellowish brown sandy clay loam to a depth of 60 inches or more. The subsoil is strongly alkaline and moderately saline.

Permeability of the Tisworth soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more for some plants, but for other it is only 10 to 20 inches because the alkalinity and salinity of the soil restrict root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Blazon soil is very shallow or shallow and well drained. It formed in residuum derived dominantly from shale. Typically the surface is 5 to 15 percent covered with medium and fine igneous gravel. The surface layer is pale brown loam 2 inches thick. The underlying material is very pale brown clay loam 10 inches thick. Weakly consolidated

shale is at a depth of 12 inches. Depth to bedrock ranges from 8 to 20 inches.

Permeability of the Blazon soil is moderate. Available water capacity is very low. Effective rooting depth is 8 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Stunner soil is mainly western wheatgrass, birdfoot sagebrush, big sagebrush, needleandthread, bluebunch wheatgrass, and gardner saltbush. As the range condition deteriorates, birdfoot sage, prairie junegrass, and Sandberg bluegrass increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 700 pounds of air-dry vegetation per acre in normal years. Production ranges from 900 pounds in favorable years to 500 pounds in unfavorable years.

The potential plant community on the Tisworth soil is mainly western wheatgrass, bottlebrush squirreltail, gardner saltbush, birdfoot sagebrush, and Indian ricegrass. As the range condition deteriorates, birdfoot sagebrush increases. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 500 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years.

The potential plant community on the Blazon soil is mainly western wheatgrass, bluebunch wheatgrass, black sagebrush, and bottlebrush squirreltail. As the range condition deteriorates, shorter grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 450 pounds of air-dry vegetation per acre in normal years. Production ranges from 600 pounds in favorable years to 250 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community.

Production of vegetation suitable for livestock grazing on the Stunner soil is limited by the high amount of calcium carbonate in the lower subsoil layers, which limits root growth. Production on the Tisworth soil is limited by the alkalinity and salinity of the soil. Production on the Blazon soil is limited by the droughtiness of the soil. In addition, the low annual precipitation influences the amount of forage available on this unit for livestock grazing.

The Stunner and Tisworth soils are moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. The Blazon soil is poorly suited for stockwater ponds due to the depth to bedrock.

The Stunner soil is moderately suited for range seeding. The main limitation is the hazard of wind erosion. The Tisworth and Blazon soils are poorly suited for range seeding. The main limitations are the salinity and alkalinity of the Tisworth soil and by the droughtiness of the Blazon soil. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation is not practical on most areas of this unit because of the amount of brush growing on the soils. It also may not be economically feasible due to the coarse texture of the surface layer. Brush control may be needed on those areas that have more brush than would be present in the potential plant community.

Adequate residue must be maintained on the surface of soil at all times until the range seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind. If range seedings are planned on the Tisworth soil, seeding rates should be increased and plant species carefully selected because of the salinity and alkalinity of the soil.

The Stunner soil is in capability subclass IVe, nonirrigated. The Tisworth soil is in capability subclass VIs, nonirrigated. The Blazon soil is in capability subclass VIIs, nonirrigated. The Stunner soil is in the Saline Loamy, 10- to 14-inch precipitation, High Plains Southeast range site; the Tisworth soil is in the Impervious Clay, 10- to 14-inch precipitation, High Plains Southeast range site; and the Blazon soil is in the Very Shallow, 10- to 14-inch precipitation, High Plains Southeast range site.

231—Stunner-Urban land complex, 0 to 6 percent slopes.

This map unit is on strath terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 60 percent Stunner sandy loam and 25 percent Urban land. The components of this unit are so intricately intermingled that is was not practical to map them separately at the scale used.

Included in this unit are small areas of Forelle loam and Rock River sandy loam. Also included are small areas of Borollic Camborthids soils. Included areas make up about 15 percent of the total acreage.

The Stunner soil is very deep and well drained. It formed in alluvium. Typically the surface layer is brown sandy loam 3 inches thick. The upper part of the subsoil is brown clay loam 9 inches thick. The next part is pale brown and very pale brown loam 14 inches thick. The lower part is pale brown sandy loam to a depth of 60 inches or more. The middle and lower subsoil layers contain a high amount of calcium carbonate.

Permeability of the Stunner soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more for some plants, but for other it is only 15 to 25 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

Urban land is covered with buildings, streets, and parking lots. The original soil is either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Red fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

If the soil is used for urban development, the main limitation is the moderately restricted premeability. If a septic system is to be installed, the absorption lines should be installed in the more permeable lower subsoil layer.

The Stunner soil is in capability subclass IVe, nonirrigated.

232—Teeler very gravelly sandy loam, 5 to 40 percent slopes.

This very deep, well drained soil is on mountainsides and alluvial fans. It formed in alluvium and colluvium derived dominantly from schist and granite. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 8,900 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 38 to 40 degrees F, and the frost-free period is less than 60 days.

Included in this unit are small areas of Bowen gravelly sandy loam and a soil similar to the Teeler soil, but which has a very gravelly sandy loam subsoil. Included areas make up about 25 percent of the total acreage.

Typically the surface is 50 percent covered with cobbles and gravel. The surface layer is very dark grayish brown very gravelly sandy loam 6 inches thick. The upper 8 inches of the subsoil are dark brown very gravelly sandy clay loam. The next 12 inches are light olive brown very gravelly sandy loam. The lower part is light brownish gray very cobbly sandy loam to a depth of 60 inches or more. The lower subsoil layer contains a high amount of calcium carbonate. This soil is outside the characteristics of the Teeler series because the subsoil has a more yellow color. This difference, however, does not significantly affect the use or management of this soil.

Permeability of the Teeler soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more for some plants, but for others it is only 15 to 25 inches because the high content of calcium carbonate restricts root growth. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is slight.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Teeler soil is mainly bluebunch wheatgrass, Griffith wheatgrass, and Parry danthonia. As the range condition deteriorates, Sandberg bluegrass, prairie junegrass, and threadleaf sedge increase. As the range condition further deteriorates, broom snakeweed, curlycup gumweed, and cheatgrass invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 800 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species in maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soil.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

This unit is in capability subclass VIe, nonirrigated. It is in the Shallow Loamy, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

233—Thiel-Lymanson-Leavitt complex, 5 to 20 percent slopes.

This map unit is on dissected fan terraces and hills. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,800 to 8,200 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 38 to 40 degrees F, and the average frost-free period is less than 60 days.

This unit is 40 percent Thiel gravelly sandy loam, 35 percent Lymanson sandy loam, and 10 percent Leavitt sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of a soil similar to the Thiel soil but is not calcareous and a soil similar to the Lymanson soil but is more than 40 inches deep to bedrock. Included areas make up about 15 percent of the total acreage.

The Thiel soil is very deep and well drained. It formed in alluvium. Typically the surface is about 25 percent covered with gravel. The surface layer is brown gravelly sandy loam 3 inches thick. The upper 9 inches of the subsoil are brown and dark yellowish brown very gravelly sandy clay loam. The next 7 inches are very pale brown very gravelly sandy loam. The lower part is very pale brown extremely gravelly loamy sand to a depth of 60 inches or more. The middle and lower subsoil layers contain a high amount of calcium carbonate.

Permeability of the Thiel soil is moderate. Available water capacity is very low. Effective rooting depth is 60 inches or more for some plants, but for others it is 15 to 25 inches because the high content of calcium carbonate restricts root growth. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is slight.

The Lymanson soil is moderately deep and well drained. It formed in alluvium derived dominantly from sandstone and tuffaceous siltstone. Typically the upper part of the surface layer is brown sandy loam 3 inches thick. The lower part is brown gravelly sandy loam 7 inches thick. The upper 8 inches of the subsoil are brown gravelly sandy clay loam. The lower part is white very gravelly loam 15 inches thick. Weakly consolidated sandstone bedrock is at a depth of 33 inches. Depth to bedrock ranges from 20 to 40 inches. This Lymanson soil is outside the characteristics of the Lymanson series because it has a very gravelly loam lower subsoil. This difference, however, does not significantly affect the use or management of this soil for the purposes of this survey.

Permeability of the Lymanson soil is moderate. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Leavitt soil is very deep and well drained. It formed in alluvium. Typically the surface is 20 percent covered with gravel. The surface layer is brown and grayish brown sandy loam 14 inches thick. The upper 8 inches of the subsoil are light brown clay loam. The next part is light yellowish brown sandy clay loam 14 inches thick. The lower part is very pale brown sandy clay loam to a depth of 60 inches or more.

Permeability of the Leavitt soil is moderate. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Thiel and Lymanson soils is mainly bluebunch wheatgrass, mutton bluegrass, needleandthread, black sagebrush, and western wheatgrass. As the range condition deteriorates, junegrass, blue grama, and rabbitbrush increase. As the range condition further deteriorates, mustard larkspur, cheatgrass, and other annuals invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Leavitt soil is mainly western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush, rabbitbrush, and blue grama increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing on the Thiel and Lymanson soils is moderately limited by the droughtiness of the soils and by the low annual precipitation. Production on the Leavitt soil is moderately limited by the low annual precipitation.

This unit is poorly suited for stockwater ponds. The main limitation is the steepness of slope. The potential for seepage losses in the Thiel soil and the depth to bedrock in the Lymanson soil are also limitations.

This unit is poorly suited for range seeding. The main limitations are the hazards of wind and water erosion. Mechanical range renovation is not practical in most areas because of the amount of sagebrush growing on the soils. Brush control may be needed in areas that are growing more sagebrush than would be present in the potential plant community.

This unit is in capability subclass VIe, nonirrigated. The Thiel and Lymanson soils are in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Leavitt soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

234—Tieside-Pilotpeak-Rock outcrop complex, 3 to 10 percent slopes.

This map unit is on cuesta dip slopes and structural benches. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature

is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 35 percent Tieside sandy loam, 35 percent Pilotpeak cobbly fine sandy loam, and 15 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Alcova sandy loam, Rohonda fine sandy loam, and Wycolo sandy loam. Included areas make up about 15 percent of the total acreage.

The Tieside soil is shallow and well drained. It formed in residuum derived from interbedded limestone, sandstone, and shale. Typically the surface layer is yellowish red sandy loam 4 inches thick. The upper part of the subsoil is yellowish red sandy loam 9 inches thick. The lower part is reddish brown sandy loam 6 inches thick. Weakly consolidated interbedded sandstone, limestone, and shale are at a depth of 19 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Tieside soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Pilotpeak soil is very shallow or shallow and well drained. It formed in residuum and colluvium derived dominantly from limestone. Typically the surface is 60 percent covered with gravel and channers. The surface layer is brown cobbly fine sandy loam 1 inch thick. The upper part of the subsoil is dark brown very channery fine sandy loam 4 inches thick. The lower 6 inches are strong brown extremely channery fine sandy loam. Hard limestone is at a depth of 11 inches. Depth to bedrock ranges from 7 to 20 inches.

Permeability of the Pilotpeak soil is moderately rapid. Available water capacity is very low. Effective rooting depth is 7 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

Rock outcrop consists of exposures of limestone and sandstone.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Tieside soil is mainly bluebunch wheatgrass, Indian ricegrass, threadleaf sedge, mutton bluegrass, and needleandthread. As the range condition deteriorates, threadleaf sedge and shrubs increase. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

The potential plant community on the Pilotpeak soil is mainly bluebunch wheatgrass, needleandthread, western wheatgrass, and mountainmahogany. As the range condition deteriorates, threadleaf sedge and rabbitbrush increase. As the range condition further deteriorates, broom snakeweed, cactus, and cheatgrass invade. The potential plant community produces about 600 pounds of air-dry vegetation per acre in normal years. Production ranges from 800 pounds in favorable years to 350 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the soils and by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the cobbles on the surface of the Pilotpeak soil and the presence of Rock outcrop in the unit. In addition, range renovation is not practical in many areas due to amount of brush growing on the soil. It also may not be economically feasible due to the droughtiness of the soils.

The Tieside and Pilotpeak soils are in capability subclass VIIs, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Tieside soil is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site. The Pilotpeak soil is in the Rocky Hills, 10- to 14-inch precipitation, High Plains Southeast range site.

235—Tismid sandy loam, 0 to 5 percent slopes.

This very deep, well drained soil is on fan terraces. It formed in alluvium. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,900 to 7,050 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Twocabin very cobbly sandy clay loam, Forelle loam, and Stunner loam. Also included is a soil similar to the Tismid soil, but which is more yellow, calcareous in the surface layer, and has weakly consolidated shale at a depth of 30 to 50 inches. Included areas make up about 25 percent of the total acreage.

Typically the surface is 5 percent covered with gravel. The surface layer is pale brown sandy loam 4 inches thick. The upper part of the subsoil is yellowish brown sandy clay loam 10 inches thick. The next part is very strongly alkaline very pale brown sandy clay loam 13 inches thick.

The lower part is pale brown loam to a depth of 60 inches or more.

Permeability of the Tismid soil is moderately slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly western wheatgrass, bottlebrush squirreltail, birdfoot sagebrush, gardner saltbush, bottlebrush squirreltail, and Indian ricegrass. As the range condition deteriorates, birdfoot sagebrush increases. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 500 pounds of air-dry vegetation per acre in normal years. Production ranges from 700 pounds in favorable years to 350 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is limited by the alkalinity of the soil and by the low annual precipitation. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Livestock grazing also should be managed to protect the unit from excessive erosion.

This soil is well suited for stockwater ponds. It is poorly suited for mechanical range renovation and range seeding; the main limitation is the alkalinity of the soil. The low annual precipitation should also be of concern when planning range seedings. Range renovation may not be practical in many areas because of the amount of brush growing on the soil. It also may not be economically feasible due to the alkalinity of the soil. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the alkalinity of the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

This unit is in capability subclass VIs, nonirrigated. It is in the Impervious Clay, 10- to 14-inch precipitation, High Plains Southeast range site.

236—Tisworth-Gerdrum Family loams, 1 to 8 percent slopes.

This map unit is on stream terraces and fan terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Tisworth loam and 30 percent Gerdrum Family loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Diamondville fine sandy loam, Forelle loam, and Stylite fine sandy loam. Also included is a soil similar to the Tisworth soil, but with gypsum in the lower subsoil. Included areas make up about 25 percent of the total acreage.

The Tisworth soil is very deep and well drained. It formed in alkaline alluvium. Typically the surface layer is dark yellowish brown loam 5 inches thick. The upper 10 inches of the subsoil are yellowish brown clay loam. The next 5 inches are light gray loam. The lower part to a depth of 60 inches or more is very pale brown sandy clay loam. The subsoil is moderately saline and strongly alkaline.

Permeability of the Tisworth soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Gerdrum Family soil is very deep and well drained. It formed in alluvium. Typically the surface layer is pale brown loam 1 inch thick. The upper part of the subsoil is strongly alkaline yellowish brown clay loam 15 inches thick. The next 21 inches are moderately saline yellowish brown clay loam. The lower part is moderately saline brown clay to a depth of 60 inches or more.

Permeability of the Gerdrum Family soil is very slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly western wheatgrass, Indian ricegrass, bottlebrush squirreltail, and gardner saltbush. As the range condition deteriorates, shrubs increase. As the range condition further deteriorates, annual forbs invade. The potential plant community produces about 500 pounds of air-dry vegetation per acre in normal years. Production ranges from 650 pounds in favorable years to 300 pounds in unfavorable years. Areas of this unit near Iron Mountain have a slightly higher production due to the higher precipitation.

The production of vegetation suitable for livestock grazing is limited by the salinity and alkalinity of the soils. If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock

grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing.

The Tisworth soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. The Gerdrum soil is well suited for stockwater ponds. This unit is poorly suited for mechanical range renovation and range seeding; the main limitations are the salinity and alkalinity of the soils. The low annual precipitation should also be of concern when planning range seedings. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity and alkalinity of the soils.

This unit is in capability subclass VIs, nonirrigated. It is in the Saline Upland, 10- to 14-inch precipitation, High Plains Southeast range site.

237—Tisworth-Gerdrum Family complex, 0 to 6 percent slopes.

This unit is on fan terraces and stream terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,800 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Tisworth sandy clay loam and 40 percent Gerdrum Family sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Abston loam, Bullock sandy loam, Elkol silty clay loam, Forelle fine sandy loam, and Pinelli clay loam. Included areas make up about 15 percent of the total acreage.

The Tisworth soil is very deep and well drained. It formed in alluvium. Typically the surface layer is strongly alkaline light yellowish brown sandy clay loam 2 inches thick. The upper part of the subsoil is very strongly alkaline yellowish brown clay loam 11 inches thick. The next 25 inches are very strongly alkaline light yellowish brown clay loam. The lower part is strongly alkaline light yellowish brown clay loam to a depth of 60 inches or more.

Permeability of the Tisworth soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Gerdrum Family soil is very deep and well drained. It formed in alluvium. Typically the surface layer is pale brown sandy loam 2 inches thick. The upper part of the subsoil is very strongly alkaline yellowish brown clay 15 inches thick. The next 19 inches are strongly alkaline yellowish brown clay loam. The lower part is moderately saline light yellowish brown silty clay loam to a depth of 60 inches or more.

Permeability of the Gerdrum Family soil is very slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on this unit is mainly western wheatgrass, bluebunch wheatgrass, needleandthread, gardner saltbush, big sagebrush, and birdfoot sagebrush. As the range condition deteriorates, blue grama, birdfoot sagebrush, and saltbush increase. As the range condition further deteriorates, foxtail barley and annual grasses and weeds invade. The potential plant community produces about 700 pounds of air-dry vegetation per acre in normal years. Production ranges from 900 pounds in favorable years to 500 pounds in unfavorable years.

The production of vegetation suitable for livestock grazing is limited by the salinity and alkalinity of the soils. If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Loss of the surface layer results in a severe decrease in productivity and in the potential of the unit to produce plants suitable for grazing. Grazing also should be managed to protect the unit from excessive erosion.

The Tisworth soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. The Gerdrum soil is well suited for stockwater ponds. This unit is poorly suited for mechanical range renovation and range seeding; the main limitations are the salinity and alkalinity of the soils. The low annual precipitation should also be of concern when planning range seedings. If range seedings are planned, seeding rates should be increased and plant species carefully selected because of the salinity and alkalinity of the soils.

This unit is in capability subclass VIs, nonirrigated. It is in the Saline Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. Included in this unit is up to

25 percent Impervious Clay, 10- to 14-inch precipitation, High Plains Southeast range site.

238—Tule-Chalkville loams, 0 to 15 percent slopes.

This map unit is on ridges and pediments. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,600 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Tule loam and 30 percent Chalkville loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Cutback fine sandy loam and Lahtida loam. Also included are small areas of tuff and tuffaceous sandstone Rock outcrop. Included areas make up about 20 percent of the total acreage.

The Tule soil is very shallow or shallow and well drained. It formed in alluvium and residuum derived dominantly from tuffaceous rock. Typically the surface layer is brown loam 3 inches thick. The upper part of the underlying material is yellowish brown loam 9 inches thick. The lower part is yellowish brown extremely gravelly loam 3 inches thick. Hard white tuff is at a depth of 15 inches. Depth to bedrock ranges from 4 to 20 inches.

Permeability of the Tule soil is moderate. Available water capacity is very low. Effective rooting depth is 6 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

The Chalkville soil is very shallow or shallow and well drained. It formed in alluvium and residuum derived dominantly from tuff. Typically the surface layer is pale brown loam 2 inches thick. The subsoil is yellowish brown clay loam 10 inches thick. The substratum is yellowish brown extremely gravelly sandy clay loam 3 inches thick. Hard tuff is at a depth of 15 inches. Depth to bedrock ranges from 9 to 20 inches.

Permeability of the Chalkville soil is moderate. Available water capacity is very low. Effective rooting depth is 9 to 20 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Tule soil is mainly bluebunch wheatgrass, bottlebrush squirreltail, and western wheatgrass. As the range condition deteriorates, black sagebrush and threadleaf sedge increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 450 pounds of air-dry vegetation per acre in normal years. Production ranges from 600 pounds in favorable years to 250 pounds in unfavorable years.

The potential plant community on the Chalkville soil is mainly bluebunch wheatgrass, western wheatgrass, and black sagebrush. As the range condition deteriorates, shorter grasses, sedges, and black sagebrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the low annual precipitation and by the droughtiness of the soils.

This unit is poorly suited for stockwater ponds due to the depth to bedrock. It is poorly suited for mechanical range renovation and range seeding; the main limitations are the droughtiness of the soils and the hazard of water erosion.

This unit is in capability subclass VIIs, nonirrigated. The Tule soil is in the Very Shallow, 10- to 14-inch precipitation, High Plains Southeast range site. The Chalkville soil is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

239—Tyzak-Rock outcrop complex, 30 to 60 percent slopes.

This map unit is on mountain hogback slopes and canyon sides. The native vegetation consists mainly of shrubs and grasses. Elevation is 6,500 to 7,500 feet. The annual precipitation is 15 to 19 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 60 percent Tyzak cobbly very fine sandy loam and 20 percent Rock outcrop. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Byrnie sandy loam, Canwall fine sandy loam, and Pilotpeak cobbly very fine sandy loam. Included areas make up about 20 percent of the total acreage.

The Tyzak soil is very shallow or shallow and well drained. It formed in colluvium and residuum derived from limestone. Typically the surface is 60 percent covered with cobbles. The surface layer is brown cobbly very fine sandy

loam 4 inches thick. The subsoil is dark grayish brown very cobbly loam 9 inches thick. Hard limestone is at a depth of 13 inches. Depth to bedrock ranges from 6 to 20 inches.

Permeability of the Tyzak soil is moderate. Available water capacity is very low. Effective rooting depth is 6 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is moderate.

Rock outcrop consists of exposures of limestone and hard sandstone.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Tyzak soil is mainly bluebunch wheatgrass, needleandthread, mountainmahogany, antelope bitterbrush, and spike fescue. As the range condition deteriorates, threadleaf sedge and juniper increase. As the range condition further deteriorates, broom snakeweed, cactus, and annual grasses and forbs invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,150 pounds in favorable years to 550 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing is limited by the droughtiness of the Tyzak soil and by the amount of Rock outcrop in the unit. Steepness of the slope limits access by livestock.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Tyzak soil is in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Tyzak soil is in the Rocky Hills, 15- to 19-inch precipitation, Foothills and Mountains Southeast range site.

240—Wycolo sandy loam, 3 to 6 percent slopes.

This moderately deep, well drained soil is on terraces and structural benches. It formed in residuum derived dominantly from interbedded sandstone and shale. The native vegetation consists mainly of grasses. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

Included in this unit are small areas of Almy loam, Rohonda sandy loam, and Thermopolis fine sandy loam. Included areas make up about 20 percent of the total acreage.

Typically the surface layer is brown sandy loam 3 inches thick. The upper part of the subsoil is strong brown and light brown sandy clay loam 13 inches thick. The lower part is strong brown sandy clay loam 24 inches thick. Weakly consolidated red shale is at a depth of 40 inches. Depth to bedrock ranges from 20 to 40 inches. The lower subsoil layer has a high amount of calcium carbonate.

Permeability of the Wycolo soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate in the lower subsoil restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Wycolo soil is western wheatgrass, needleandthread, big sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

This soil is poorly suited for stockwater ponds due to the depth to bedrock. It is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community. To reduce the hazard of wind erosion, adequate residue must be maintained on the surface of soil at all times until the seeding is established. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass IVe, nonirrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

241—Wycolo-Alcova complex, 3 to 10 percent slopes.

This map unit is on terraces with a mound-intermound pattern of microrelief. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 45 percent Wycolo fine sandy loam and 35 percent Alcova gravelly sandy loam. The Wycolo soil is on toe slopes of mounds and in intermound areas. The Alcova soil is on mounds. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Joemre fine sandy loam, Pilotpeak cobbly fine sandy loam, Rohonda fine sandy loam, and Tieside sandy loam. Included areas make up about 20 percent of the total acreage.

The Wycolo soil is moderately deep and well drained. It formed in residuum derived dominantly from interbedded red sandstone and shale. Typically the surface layer is light brown and reddish brown fine sandy loam 6 inches thick. The upper part of the subsoil is brown sandy clay loam 6 inches thick. The next part is pink loam and clay loam 13 inches thick. The lower part is light reddish brown clay loam 11 inches thick. Weakly consolidated red gypsiferous shale is at a depth of 36 inches. Depth to bedrock ranges from 20 to 40 inches. The middle and lower subsoil layers have a high amount of calcium carbonate.

Permeability of the Wycolo soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more for some plants, but for others it is only 12 to 24 inches because the high content of calcium carbonate restricts root growth. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Alcova soil is very deep and well drained. It formed in alluvium overlying residuum derived from redbed sandstone. Typically the surface is 25 percent covered with granitic gravel. The surface layer is brown gravelly sandy loam 4 inches thick. The upper part of the subsoil is strong brown gravelly sandy clay loam 20 inches thick. The lower part is reddish yellow very gravelly sandy clay loam to a depth of 60 inches or more.

Permeability of the Alcova soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is moderate.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on this unit is western wheatgrass, needleandthread, bluebunch wheatgrass, and big sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community. Production of vegetation suitable for livestock grazing is moderately limited by the low annual precipitation.

The Wycolo soil is poorly suited for stockwater ponds due to the depth to bedrock. The Alcova soil is moderately well suited for stockwater ponds; the moderate potential for seepage losses is the main limitation. This unit is moderately suited for mechanical range renovation and range seeding; the main limitations are the gravel in the surface layer of the Alcova soil and the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

Adequate residue must be maintained on the surface of soil at all times until the seeding is established to reduce the hazard of wind erosion. Areas tilled for seeding must remain narrow and at right angles to the wind.

This unit is in capability subclass IVe, nonirrigated. It is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site.

242—Wycolo-Alcova-Urban land complex, 3 to 6 percent slopes.

This map unit is on terraces. The native vegetation consists mainly of grasses and shrubs. Elevation is 7,000 to 7,500 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 30 percent Wycolo fine sandy loam, 25 percent Alcova gravelly sandy loam, and 25 percent Urban land.

Included in this unit are small areas of Joemre fine sandy loam, Pilotpeak cobbly fine sandy loam, Rohonda fine sandy loam, and Tieside sandy loam. Included areas make up about 20 percent of the total acreage.

The Wycolo soil is moderately deep and well drained. It formed in residuum derived dominantly from interbedded sandstone and shale. Typically the surface layer is light brown fine sandy loam 6 inches thick. The upper part of the subsoil is brown sandy clay loam 6 inches thick. The next part is pink loam and clay loam 14 inches thick. The lower part is light reddish brown clay loam 10 inches thick. Weakly consolidated red shale is at a depth of 36 inches. Depth to bedrock ranges from 20 to 40 inches. The middle and lower subsoil layers have a high amount of calcium carbonate.

Permeability of the Wycolo soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches for some plants, but for others it is only 12 to 24 inches because the high content of calcium carbonate restricts root growth. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is severe.

The Alcova soil is very deep and well drained. It formed in alluvium overlying residuum derived from redbed sandstone. Typically the surface is 25 percent covered with granitic gravel. The surface layer is brown gravelly sandy loam 4 inches thick. The upper part of the subsoil is strong brown gravelly sandy clay loam 20 inches thick. The lower part is reddish yellow very gravelly sandy clay loam to a depth of 60 inches or more.

Permeability of the Alcova soil is moderate. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow and the hazard of water erosion is slight. The hazard of wind erosion is moderate.

Urban land is covered with buildings, streets, and parking lots. The original soil is either altered, removed, or buried with fill. Soil material under or immediately adjacent to structures may have been hauled to the site. Red fine sandy loam fill material is common in the city of Laramie.

This unit is used for urban development.

If the Wycolo soil is used for urban development, the main limitations are the shrink-swell potential and the depth to bedrock. If the Alcova soil is used for urban development, the main limitaion is the moderately restricted permeability. Septic tank absorption fields buried in the bedrock underlying the Wycolo soil do not function properly. The Alcova soil is better suited for septic tank absorption fields, but the size of the field should be large enough to overcome the moderately restricted permeability. Excavations deeper than 20 to 40 inches in areas of the Wycolo soil are somewhat difficult because of the underlying bedrock. Paved roads and foundations of buildings should be designed to offset the effects of the shrinking and swelling of the Wycolo soil.

The Wycolo and Alcova soils are in capability subclass IVe, nonirrigated.

243—Wycolo-Tieside sandy loams, 3 to 10 percent slopes.

This map unit is on structural benches, terraces, and on hills. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 50 percent Wycolo sandy loam and 35 percent Tieside sandy loam. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Alcova sandy loam, Pilotpeak cobbly fine sandy loam, and Rohonda fine sandy loam. Also included are small areas of soils similar to the Wycolo soil, but with a clay loam subsoil or a thinner subsoil. Included areas make up about 15 percent of the total acreage.

The Wycolo soil is moderately deep and well drained. It formed in residuum derived dominantly from interbedded sandstone and shale. Typically the surface layer is brown sandy loam 2 inches thick. The upper part of the subsoil is dark reddish brown sandy clay loam 9 inches thick. The lower part is reddish brown sandy clay loam 20 inches thick. Weakly consolidated red sandstone is at a depth of 31 inches. Depth to bedrock ranges from 20 to 40 inches. The lower subsoil layer has a high amount of calcium carbonate.

Permeability of the Wycolo soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Tieside soil is shallow and well drained. It formed in residuum derived dominantly from interbedded sandstone, shale, and limestone. Typically the surface is 10 percent covered with cobbles. The surface layer is yellowish red sandy loam 1 inch thick. The upper part of the subsoil is yellowish red sandy loam 5 inches thick. The lower part is light reddish brown sandy loam 8 inches thick. Weakly consolidated red sandstone is at a depth of 14 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Tieside soil is moderately rapid. Available water capacity is very low. Effective rooting depth is only 10 to 20 inches. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

This unit is used as rangeland and for wildlife habitat.

The potential plant community on the Wycolo soil is western wheatgrass, needleandthread, bluebunch

wheatgrass, and big sagebrush. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Tieside soil is mainly bluebunch wheatgrass, Indian ricegrass, threadleaf sedge, mutton bluegrass, and needleandthread. As the range condition deteriorates, threadleaf sedge and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation on the Wycolo soil suitable for livestock grazing is moderately limited by the low annual precipitation. Production on the Tieside soil is limited by the droughtiness of the soil and by the low annual precipitation.

This unit is poorly suited for stockwater ponds due to the depth to bedrock. It is moderately suited for mechanical range renovation and range seeding; the main limitation is the hazard of wind erosion. The low annual precipitation should also be of concern when planning range seedings. Mechanical range renovation may not be practical in many areas because of the amount of sagebrush growing on the soil. In addition, it may not be economically feasible on the Tieside soil due to the droughtiness of that soil. Brush control may be needed in areas that are growing more brush than would be present in the potential plant community.

The Wycolo soil is in capability subclass IVe, nonirrigated. The Tieside soil is in capability subclass VIIs, nonirrigated. The Wycolo soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Tieside soil is in the Shallow Sandy, 10- to 14-inch precipitation, High Plains Southeast range site.

244—Wycolo-Thermopolis-Rock outcrop complex, 10 to 50 percent slopes.

This map unit is on cuesta escarpments. The native vegetation consists mainly of grasses and shrubs. Elevation is 6,000 to 7,800 feet. The annual precipitation is 10 to 14 inches, the annual air temperature is 40 to 45 degrees F, and the frost-free period is 85 to 110 days.

This unit is 40 percent Wycolo fine sandy loam, 10 to 20 percent slopes; 30 percent Thermopolis fine sandy loam, 20 to 50 percent slopes; and 10 percent Rock outcrop. The Wycolo soil is on the foot slopes of escarpments and in concave areas. The Thermopolis soil and the Rock outcrop are on the shoulder and back slopes of escarpments. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are small areas of Byrnie sandy loam, Joemre fine sandy loam, and Rohonda fine sandy loam. Included areas make up about 20 percent of the total acreage.

The Wycolo soil is moderately deep and well drained. It formed in residuum derived dominantly from interbedded sandstone and shale. Typically the surface layer is yellowish red fine sandy loam 3 inches thick. The upper part of the subsoil is yellowish red sandy clay loam 10 inches thick. The lower part is reddish yellow and yellowish red sandy clay loam 11 inches thick. Weakly consolidated red shale is at a depth of 24 inches. Depth to bedrock ranges from 20 to 40 inches. A small amount of gypsum is present in the subsoil. The lower subsoil layer has a high amount of calcium carbonate.

Permeability of the Wycolo soil is moderate. Available water capacity is low. Effective rooting depth is 60 inches or more for some plants, but for others it is only 10 to 20 inches because the high content of calcium carbonate restricts root growth. Runoff is medium and the hazard of water erosion is moderate. The hazard of wind erosion is severe.

The Thermopolis soil is shallow and well drained. It formed in residuum and colluvium derived dominantly from siltstone and shale. Typically the surface is 25 percent covered with limestone and sandstone gravel. The surface layer is reddish brown fine sandy loam 2 inches thick. The upper 3 inches of the subsoil are yellowish red loam. The lower 9 inches are red silt loam. Weakly consolidated red shale is at a depth of 14 inches. Depth to bedrock ranges from 10 to 20 inches.

Permeability of the Thermopolis soil is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid and the hazard of water erosion is severe. The hazard of wind erosion is severe.

Rock outcrop consists of exposures of red shale, sandstone, and limestone.

This unit is used mainly as rangeland and for wildlife habitat.

The potential plant community on the Wycolo soil is mainly western wheatgrass, needleandthread, big

sagebrush, and bluebunch wheatgrass. As the range condition deteriorates, big sagebrush and rabbitbrush increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 1,100 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,400 pounds in favorable years to 600 pounds in unfavorable years.

The potential plant community on the Thermopolis soil is mainly bluebunch wheatgrass, needleandthread, mutton bluegrass, black sagebrush, and western wheatgrass. As the range condition deteriorates, shorter grasses and shrubs increase. As the range condition further deteriorates, annual forbs and grasses invade. The potential plant community produces about 900 pounds of air-dry vegetation per acre in normal years. Production ranges from 1,200 pounds in favorable years to 700 pounds in unfavorable years.

If the range is overgrazed, the proportion of preferred forage plants decreases while the proportion of less preferred forage plants increases. Therefore, livestock grazing should be managed so that the desired balance of species is maintained in the plant community; it also should be managed to protect the unit from excessive erosion. Production of vegetation suitable for livestock grazing on the Wycolo soil is moderately limited by the low annual precipitation. Production on the Thermopolis soil is limited by the droughtiness of the soil and by the low annual precipitation.

This unit is poorly suited for stockwater ponds, mechanical range renovation, and range seeding due to the steepness of slope.

The Wycolo soil is in capability subclass VIe, nonirrigated. The Thermopolis soil is in capability subclass VIIe, nonirrigated. Rock outcrop is in capability subclass VIIIs. The Wycolo soil is in the Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. The Thermopolis soil is in the Shallow Loamy, 10- to 14-inch precipitation, High Plains Southeast range site. Areas of this map unit near Iron Mountain are in similar range sites in the 15- to 17-inch precipitation, Southern Plains zone.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The system of land capability classification (Murray, 1974) used by the Natural Resources Conservation Service is explained, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of barnyard manure and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the

way they respond to management. The criteria used in grouping do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels— capability class, subclass, and unit. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s*, or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability class or subclass of each soil is shown in table 5 and is also given in the section "Detailed Soil Map Units."

Water Quality in Agriculture

The potential for impacting the quality of surface or ground water should be considered in the planning and management of all agricultural operations. The potential for impacting water quality exists whenever pesticides, fertilizers and manures are used in proximity to surface waters or aquifers. Removal of these materials from the application site by surface water runoff and soil leaching is the main hazard.

Impairment by Pesticides

Water quality impairment can occur if pesticides are leached below the root zone or enter a water body attached to suspended sediment or in solution of runoff waters. The potential for loss of pesticides by surface water runoff or leaching is a combined function of soil and pesticide properties, climate factors, kind of crop, and application method.

To minimize the potential for surface or ground water quality impairment by pesticides, the use of a pest management system is recommended. Pest management systems target infestations of weeds, insects, or disease. These systems reduce the adverse effects of pest infestations to plant growth and crop production while minimizing adverse effects to environmental resources. These systems utilize the most appropriate measures or combinations of measures for pest control, including biological, cultural and chemical, and include environmental effects, health hazards, and economic benefits. Field scouting and economic thresholds are used to determine if pesticides should be used and the time of application. Only necessary and properly timed applications of pesticides are utilized.

In a pest management system, the time of application is chosen with consideration of the soil moisture condition, anticipated weather condition, and irrigation schedules. Proper timing of applications reduces the potential for loss by leaching or surface water runoff. Erosion-control practices are used to minimize soil loss, surface water runoff, and the transport of adsorbed or dissolved pesticides to surface waters.

Characteristics of pesticides, such as solubility, toxicity, degradation, and absorption, are considered in pesticide selection. Soil, geology, depth to water table, proximity to surface water, topography, and climate are site characteristics which affect pesticide transport. This information on pesticide properties and site characteristics is considered when pesticides are

selected to minimize the potential for impairment of the quality of surface and ground water.

In table 6, the soils in the survey area have been rated for their relative potential for pesticide loss through leaching and surface water runoff. These ratings and the information on pesticide properties, climate, kind of crop, and application method are used to determine the potential for water-quality impairment.

The soil leaching and surface loss potential ratings given in table 6 were developed from information on soil parameters. These ratings represent the relative capacity of a soil to retain a pesticide at the point of application, regardless of management or climatic inputs. The properties of pesticides, climatic factors, kind of crop, and application method were not considered in the development of these ratings.

The soil properties and features used in the development of the ratings for potential pesticide loss through soil leaching are those that affect the infiltration rate, permeability, and the pesticide attenuation capacity. These soil properties are soil texture, surface layer thickness, organic matter content, structure, bulk density, permeability of soil or bedrock, shrink-swell potential, depth to bedrock, depth to a water table, and slope. Infiltration rate is interpreted from the hydrologic soil group and slope.

The soil properties and features considered in the ratings for potential pesticide loss to surface water runoff are those that affect rates of runoff and erosion. They include soil texture, organic matter content, structure, particle-size distribution, permeability, restricting layers, soil depth, depth to water table, flooding, slope and shrink-swell potential.

A rating of *slight* indicates a slight probability for loss of pesticides if pesticides with very small, small or medium loss potentials are used. A rating of *moderate* indicates a slight probability for loss of pesticides if pesticides with very small or small loss potentials are used, and a moderate probability of pesticide loss if pesticides with a medium or large potential for loss are used. A rating of *severe* indicates a moderate probability for loss of pesticides if pesticides with very small or small loss potentials are used, and a high probability of pesticide loss if pesticides with a medium or large potential for loss are used.

In these ratings, the pesticide is considered to have been applied to bare soil by either surface or aerial methods. If the pesticide is applied to a field of a growing crop or weeds, the potential for pesticide loss will be lower. Information on pesticide properties can be obtained for the local office of the Natural Resources Conservation Service or Extension Service or from pesticide dealers.

If the possibility for pesticide loss by soil leaching or surface water runoff is identified, an onsite evaluation is usually necessary to determine the potential impacts on water quality. If water quality will be affected, the land user should consider alternative pesticides, alternative management practices, alternative application methods, or cultural or biological pest- control methods to reduce the potential of pesticide loss.

Impairment by Nutrients

An adequate and timely supply of nutrients is necessary for maximum crop production. It is important that nutrients added to the soil are efficiently used because nutrient amounts in excess of crop needs can result in pollution. Nutrient management consists of measures that minimize the amount of nutrients available for potential impairment of the quality of surface and ground water while providing an optimum amount for crop production. The rate of fertilizer application is important in minimizing the losses through leaching and surface water runoff. The amount of fertilizer applied should be based on a realistic yield goal. A proper balance of essential nutrients and soil moisture is necessary. A deficiency of one element may reduce the use of other nutrients by the crop. The nutrients which have not been used by the crop are available for offsite transport. Soil tests are an important guide to the proper use of fertilizers. These tests, combined with information about soil type, previous cropping history, and anticipated soil moisture level, should be used to estimate fertilizer requirements. Use of crops which require a small amount of nitrogen, such as legumes, in rotation with crops that require a large amount of nitrogen reduces the potential for nutrient loss. Use of ammonium nitrogen fertilizers, such as anhydrous ammonia, can be used can help reduce nitrate leaching. If practical, all fertilizer should be incorporated into the soil to reduce the loss by volatilization and surface water runoff.

Proper timing of fertilizer applications can be effective in reducing the potential losses of nutrients. Nitrogen should be applied as closely to the plant demand periods as possible. Split applications of nitrogen, especially on sandy soils, helps to reduce leaching losses. Apply half of the requirement at planting time and the other half at the critical growth stage of the crop.

Irrigation water management is very effective in reducing the amount of nitrogen leached from irrigated fields. Irrigation efficiency must be high at all times to reduce the amount of leaching caused by deep percolation.

Use practices for erosion and runoff control reduces the amount of nitrogen or phosphorus transported to surface waters. Maintaining adequate amounts of crop residue on the surface and good soil tilth increases water infiltration and reduces the potential for nutrient loss by surface water runoff.

Rangeland

Robert E. Baumgartner, Range Conservationist, Natural Resources Conservation Service, assisted in the preparation of this section.

Rangeland is land on which the potential plant community is predominantly native grasses, grass-like plants, forbs, and shrubs suitable for grazing and browsing use. About 94 percent of the survey area is rangeland. The majority of ranch income is derived from livestock, principally cattle. Cow-calf operations dominate. Livestock estimates for the county in 1983 were for 54,000 cattle and 7,500 sheep (Wyoming Recreation Commission, 1976). Average ranch size is about 9,000 acres.

On many ranches the forage produced on rangeland is augmented by corn and protein supplements. In winter the native forage is supplemented by hay and protein concentrate. Creep feeding of calves and yearlings to increase market weight is done on a few ranches.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Table 7 shows, for each soil, the range site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. Only those soils that are used as rangeland or are suited to use as rangeland are listed. Explanation of the column headings in table 7 follows.

A *range site* is a distinctive kind of rangeland that produces a characteristic natural plant community that differs from natural plant communities on other range sites in kind, amount, and proportion of range plants. The relationship between soils and vegetation was ascertained during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Total production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods.

Characteristic vegetation—the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by common name. Under *composition*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential natural plant community on a particular range site. The more closely the existing community resembles the potential community, the better the range condition. Range condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community in a given use.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Among the important range management practices on all rangeland in the survey area are proper grazing use and planned grazing systems, which include deferred grazing and proper season of use in combination with good distribution of grazing. Distribution of grazing can be accomplished with proper placement of salt and watering facilities, combined with fencing where needed. The suitability of range improvement practices, such as brush management, range seeding, and renovation depends on the characteristics of the given site.

Windbreaks and Environmental Plantings

Richard Rintamaki, State Biologist, Natural Resources Conservation Service, assisted in the preparation of this section.

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil and snow management objectives. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings, reduce building heating and cooling costs, and reduce noise. Tree and shrub plantings can also reduce wave action on ponds and harvest snow for stockwater, wildlife water, and irrigation water.

Tables 8a, 8b, and 8c show the height that selected adaptable trees and shrubs are expected to reach, given adequate care, in 20 years for each represented soil group and planting zone. The windbreak suitability grouping and planting zone designation for every soil in a detailed soil map unit is given in table 9. Definitions of the windbreak suitability groups and planting zones are given below. This information can be used as a guide in planning windbreaks and other tree and shrub plantings.

Adaptability for planting trees and shrubs in Wyoming was based on each plant species' tolerance for the minimum and maximum air temperatures, soil temperatures of an area, and data and observations collected from woody plant material trials and existing windbreaks.

Additional information on planning windbreaks and other environmental plantings as well as planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service, the Cooperative Extension Service, or from a commercial nursery.

The windbreak suitability groups in this survey area are described in the following paragraphs.

Windbreak suitability group 1.—The soils in this group are very deep or deep and somewhat poorly drained to well drained. They have loamy surface layers and subsoils, and have less than 35 percent rock fragments by volume throughout. Available water capacity of the soil is more than 7.5 inches. In the upper 12 inches of the soil the pH is less than 7.9, the electrical conductivity is less than 2 millimhos per centimeter, and carbonates are generally absent, but never exceed 5 percent calcium carbonate equivalent. Depth to a water table during the growing season is 3 to 5 feet, or the site receives beneficial moisture from surrounding landscapes or frequent flooding.

This group is well suited for windbreaks and environmental plantings. Planting may be delayed for a short period in spring because of wetness. The water table in the soils in this group provides moisture to the trees and shrubs once they have established roots to the depth of the water table.

Windbreak suitability group 1H.—The soils in this group are organic (peat) and moderately deep to very deep. Available water capacity of the soil is more than 7.5 inches. In the upper 12 inches of the soil the pH is less than 7.9, and the electrical conductivity is less than 4 millimhos per centimeter. Depth to the water table during the growing season is 3 to 5 feet, or the site receives beneficial moisture from surrounding landscapes or frequent flooding.

This group is moderately well suited for windbreaks and environmental plantings. Planting may be delayed for a short period in spring because of wetness. Because these soils are dominantly composed of peat, special planting considerations are necessary. The water table in the soils of this group provides moisture to the trees and shrubs once they have established roots to that depth.

Windbreak suitability group 1KK.—The soils in this group are very deep or deep and somewhat poorly drained to well drained. They have loamy surface and subsoil layers and have less than 35 percent rock fragments by volume throughout. Available water capacity of the soil is more than 7.5 inches. In the upper 12 inches of the soil the pH values range from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and carbonates range from 15 to 40 percent calcium carbonate equivalent. Depth to a water table during the growing season is 3 to 5 feet, or the site receives beneficial moisture from surrounding landscapes or frequent flooding.

This group is moderately suited for windbreaks and environmental plantings. Planting may be delayed for a short period in the spring because of wetness. The very high carbonates and high pH in the soil significantly limit the selection and rate of growth of trees and shrubs. The water table in the soils of this group provides moisture to the trees and shrubs once they have established roots to that depth.

Windbreak suitability group 1KW.—The soils in this group are very deep or deep and somewhat poorly drained to well drained. They have loamy surface and subsoil layers and have less than 35 percent rock fragments by volume throughout. Available water capacity of the soil is more than 7.5 inches. In the upper 12 inches of the soil the pH values range from 7.9 to 8.4, the

electrical conductivity is less than 4 millimhos per centimeter, and carbonates range from 5 to 15 percent calcium carbonate equivalent. Depth to a water table during the growing season is 3 to 5 feet, or the site receives beneficial moisture from surrounding landscapes or frequent flooding.

This group is moderately well suited for windbreaks and environmental plantings. Planting may be delayed for a short period in the spring because of wetness. The amount of carbonates and high pH in the soil slightly limits the selection and rate of growth of trees and shrubs. The water table in the soils of this group provides moisture to the trees and shrubs once they have established roots to the depth of the water table.

Windbreak suitability group 2.—The soils in this group are very deep or deep, poorly drained to somewhat poorly drained, and excessively wet or ponded during the spring or overflow periods. These soils range from sandy to clayey. Rock fragments in the soil may range up to 60 percent by volume. Available water capacity of the soil is more than 2 inches. In the upper 12 inches of the soil the pH is less than 7.9, the electrical conductivity is less than 2 millimhos per centimeter, and carbonates are generally absent but never exceed 5 percent calcium carbonate equivalent. Depth to a water table during the growing season is 1.5 to 3 feet.

This group is moderately well suited for windbreaks and environmental plantings. Special planting considerations will be necessary because these soils are wet during the growing season. Wetness limits the rooting depth and survival of some species. The selection of trees and shrubs should be based on this limitation.

Windbreak suitability group 2H.—The soils in this group are organic (peat), very deep or deep, and poorly drained to somewhat poorly drained. Available water capacity of the soil is more than 7.5 inches. In the upper 12 inches of the soil the calcium carbonate equivalent is less than 1 percent, the pH is less than 7.9, and the electrical conductivity is less than 2 millimhos per centimeter. Depth to a water table during the growing season is 1.5 to 3 feet.

This group is moderately suited for windbreaks and environmental plantings. Because these soils are wet and dominantly composed of peat, special planting considerations are necessary. Wetness limits the rooting depth and survival of some species. The selection of trees and shrubs should be based on this limitation.

Windbreak suitability group 2KK.—The soils in this group are very deep or deep, poorly drained to somewhat poorly drained, and excessively wet or ponded during the spring or overflow periods. These soils range from sandy to clayey. Rock fragments in the soil may range up to 60 percent by volume. Available water capacity of the soil is more than 2 inches. In the upper 12 inches of the soil the pH ranges from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and carbonates range from 15 to 40 percent calcium carbonate equivalent. Depth to a water table during the growing season is 1.5 to 3 feet.

This group is moderately suited for windbreaks and environmental plantings. Special planting considerations will be necessary because these soils are wet during the growing season. The very high amount of carbonates and high pH in the soil significantly limits the rate of growth of trees and shrubs. Wetness limits the rooting depth and survival of some species. The selection of trees and shrubs should be based on these limitations.

Windbreak suitability group 2KW.—The soils in this group are very deep or deep, poorly to somewhat poorly drained, and excessively wet or ponded during the spring or overflow periods. These soils range from sandy to clayey. Rock fragments in the soil may range up to 60 percent by volume. Available water capacity of the soil is more than 2 inches. In the upper 12 inches of the soil the pH values range from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and carbonates range from 5 to 15 percent calcium carbonate equivalent. Depth to a water table during the growing season is 1.5 to 3 feet.

This group is moderately suited for windbreaks and environmental plantings. Special planting considerations will be necessary because these soils are wet during the growing season. The amount of carbonates and high pH in the soil moderately limits the rate of growth of trees and shrubs. Wetness limits the rooting depth and survival of some species. The selection of trees and shrubs should be based on these limitations.

Windbreak suitability group 3.—The soils in this group are very deep or deep and moderately well to well drained. They have loamy surface and subsoil layers and have less than 35 percent rock fragments by volume throughout. Available water capacity of the soil is more than 7.5 inches. In the upper 12 inches of the soil the pH is less than 7.9, the electrical conductivity is less than 2 millimhos per centimeter, and carbonates are generally absent, but never exceed 5 percent calcium carbonate equivalent. Depth to a water table during the growing season is more than 5 feet.

This group is well suited for windbreaks and environmental plantings.

Windbreak suitability group 4.—The soils in this group are moderately deep to very deep and moderately well drained to well drained. The upper 8 to 20 inches of the soil are loamy; below this depth the soils are clayey. Rock fragments throughout the soil may range to 60 percent by volume. Available water capacity of the soil to underlying bedrock is more than 5 inches. In the upper 12 inches of the soil the pH is less than 7.9, the electrical conductivity

is less than 2 millimhos per centimeter, and carbonates are generally absent, but never exceed 5 percent calcium carbonate equivalent. Depth to a water table during the growing season is more than 5 feet.

This group is moderately well suited for windbreaks and environmental plantings. A high content of clay in the lower part of the soil moderately limits the selection and rate of growth of trees and shrubs. The droughtiness of the moderately deep soils in this group is also a limiting factor.

Windbreak suitability group 4C.—The soils in this group are moderately deep to very deep and moderately well drained to well drained. Typically these soils are clayey throughout. However, the upper 8 inches may be loamy. Rock fragments throughout the soil may range to 60 percent by volume. Available water capacity of the soil to underlying bedrock or other restrictive layers is more than 3.75 inches. In the upper 12 inches of the soil the pH is less than 7.9, the electrical conductivity is less than 2 millimhos per centimeter, and calcium carbonate equivalent does not exceed 5 percent. Depth to a water table during the growing season is more than 5 feet.

This group is moderately suited for windbreaks and environmental plantings. The high content of clay limits the selection and rate of growth of trees and shrubs. The droughtiness of the moderately deep soils in this group is also a limiting factor. Because of the high content of clay, extra care is need to ensure that the soil is firmly packed around the roots when trees and shrubs are planted.

Windbreak suitability group 4CK.—The soils in this group are moderately deep to very deep and moderately well drained to well drained. Typically these soils are clayey throughout. However, the upper 8 inches may be loamy. Rock fragments throughout the soil may range to 60 percent by volume. Available water capacity of the soil to underlying bedrock or other restrictive layers is more than 3.75 inches. In the upper 12 inches of the soil the pH ranges from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and the calcium carbonate equivalent ranges from 5 to 15 percent. Depth to a water table during the growing season is more than 5 feet.

This group is moderately suited for windbreaks and environmental plantings. The high content of clay, high pH, and amount of carbonates moderately limit the selection and rate of growth of trees and shrubs. The droughtiness of the moderately deep soils in this group is also a limiting factor. Because of high content of clay, extra care is need to ensure that the soil is firmly packed around the roots when trees and shrubs are planted.

Windbreak suitability group 4K.—The soils in this group are moderately deep to very deep and moderately well drained to well drained. The upper 8 to 20 inches of the soil are loamy; below this depth the soils are clayey. Rock fragments throughout the soil may range to 60 percent by volume. Available water capacity of the soil to underlying bedrock or other restrictive layers is more than 5 inches. In the upper 12 inches of the soil the pH ranges from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and carbonates range from 5 to 15 percent calcium carbonate equivalent. Depth to a water table during the growing season is more than 5 feet.

This group is moderately suited for windbreaks and environmental plantings. The high content of clay in the lower part of the soil, the amount of carbonates, and the high pH moderately limit the selection and rate of growth of trees and shrubs. The droughtiness of the moderately deep soils in this group is also a limiting factor.

Windbreak suitability group 5.—The soils in this group are very deep or deep and moderately well drained to well drained. They have loamy surface and subsoil layers. Rock fragments throughout the soil may range to 60 percent by volume. Available water capacity of the soil ranges from 3.75 to 7.5 inches. In the upper 12 inches of soil, the pH is less than 7.9, the electrical conductivity is less than 2 millimhos per centimeter, and the calcium carbonate equivalent is less than 5 percent. Depth to a water table during the growing season is more than 5 feet.

This group is moderately well suited for windbreaks and environmental plantings. The droughtiness of the soil moderately limits the selection and rate of growth of trees and shrubs.

Windbreak suitability group 5K.—The soils in this group are very deep or deep and moderately well drained to well drained. They have loamy surface and subsoil layers. Rock fragments throughout the soil may range to 60 percent by volume. Available water capacity of the soil ranges from 3.75 to 7.5 inches. In the upper 12 inches of soil the pH ranges from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and calcium carbonate equivalent ranges from 5 to 15 percent. Depth to a water table during the growing season is more than 5 feet.

This group is moderately suited for windbreaks and environmental plantings. The amount of carbonates, high pH, and droughtiness of the soil moderately limit the selection of trees and shrubs.

Windbreak suitability group 5KK.—The soils in this group are very deep or deep and moderately well drained to well drained. They have loamy surface and subsoil layers. Rock fragments throughout the soil may range to 60 percent by volume. Available water capacity of the soil ranges from 3.75 to 7.5 inches. In the upper 12 inches of soil, the pH ranges from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and the calcium carbonate equivalent ranges from 15 to 40

percent. Depth to a water table during the growing season is more than 5 feet.

This group is poorly suited for windbreaks and environmental plantings. The very high amount of carbonates, high pH, and the droughtiness of the soil significantly limit the selection of trees and shrubs.

Windbreak suitability group 6.—The soils in this group are moderately deep over sand, gravel, and similar layers with a water permeability of more than 20 inches per hour or other layers restrictive to roots. These soils are well drained to excessively drained. The upper part of the soils are loamy, and may contain up to 60 percent rock fragments by volume. Available water holding capacity of the soil to underlying bedrock or other restrictive layers is 2.0 to 3.75 inches. In the upper 12 inches of soil, the pH is less than 7.9, the electrical conductivity is less than 2 millimhos per centimeter, and the calcium carbonate equivalent is less than 5 percent. Depth to a water table during the growing season is more than 5 feet.

This group is poorly suited for windbreaks and environmental plantings. The droughtiness of the soil significantly limits the selection and rate of growth of trees and shrubs. Providing permanent supplemental water is recommended for successful establishment and growth of trees and shrubs.

Windbreak suitability group 6D.—The soils in this group are moderately deep over an impervious layer. They are well drained to excessively drained. They have loamy or clayey surface and subsoil layers. Rock fragments throughout the soil may range to 60 percent by volume. Available water capacity of the soil to underlying bedrock or other restrictive layers is more than 3.75 inches but commonly less than 7.5 inches. In the upper 12 inches of the soil the calcium carbonate equivalent is less than 5 percent, the pH is less than 7.9 and the electrical conductivity is less than 2 millimhos per centimeter. Depth to a water table during the growing season is more than 5 feet.

This group is moderately suited for windbreaks and environmental plantings. The droughtiness of the soil moderately limits the selection and rate of growth of trees and shrubs.

Windbreak suitability group 6DK.—The soils in this group are moderately deep over an impervious layer. They are well drained to excessively drained. They have loamy or clayey surface and subsoil layers. Rock fragments throughout the soil may range to 60 percent by volume. Available water capacity of the soil to underlying bedrock or other restrictive layers is more than 3.75 inches but commonly less than 7.5 inches. In the upper 12 inches of soil, the pH ranges from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and the calcium carbonate equivalent ranges from 5 to 15 percent. Depth to a water table during the growing season is more than 5 feet.

This group is moderately suited for windbreaks and environmental plantings. The amount of carbonates, high pH, and the droughtiness of the soil moderately limit the selection and rate of growth of trees and shrubs.

Windbreak suitability group 6G.—The soils in this group are moderately deep over sand, gravel, and similar layers with a water permeability of more than 20 inches per hour. These soils are well drained to excessively drained. The surface and subsoil layers are loamy or clayey and may contain up to 60 percent rock fragments by volume. Available water holding capacity of the soil is more than 3.75 inches but commonly less than 7.5 inches. In the upper 12 inches of the soil the calcium carbonate equivalent is less than 5 percent, the pH is less than 7.9, and the electrical conductivity is less than 2 millimhos per centimeter. Depth to a water table during the growing season is more than 5 feet.

This group is moderately suited for windbreaks and environmental plantings. The droughtiness of the soil moderately limits the selection and rate of growth of trees and shrubs.

Windbreak suitability group 6GK.—The soils in this group are moderately deep over sand, gravel, and similar layers with a water permeability of more than 20 inches per hour. They are well drained to excessively drained. The surface and subsoil layers are loamy or clayey and may contain up to 60 percent rock fragments by volume. Available water holding capacity of the soil is more than 3.75 inches but commonly less than 7.5 inches. In the upper 12 inches of soil, the pH ranges from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and the calcium carbonate equivalent ranges from 5 to 15 percent. Depth to a water table during the growing season is more than 5 feet.

This group is moderately suited for windbreaks and environmental plantings. The amount of carbonates, high pH, and the droughtiness of the soil moderately limit the selection and rate of growth of trees and shrubs.

Windbreak suitability group 6GKK.—The soils in this group are moderately deep over sand, gravel, and similar layers with a water permeability of more than 20 inches per hour. They are well drained to excessively drained. The surface and subsoil layers are loamy or clayey and may contain up to 60 percent rock fragments by volume. Available water holding capacity of the soil is more than 3.75 inches but commonly less than 7.5 inches. In the upper 12 inches of soil, the pH ranges from 7.9 to 8.4, the electrical conductivity is less Man 4 millimhos per centimeter, and the calcium carbonate equivalent ranges from 15 to 40 percent. Depth to a water table during the growing season is more than 5 feet

This group is poorly suited for windbreaks and environmental plantings. The very high amount of carbonates, high pH, and the droughtiness of the soil significantly limit the selection and rate of growth of trees and shrubs.

Windbreak suitability group 6K.—The soils in this group are moderately deep over sands, gravel, and similar layers with a water permeability of more than 20 inches per hour or other layers restrictive to roots. They are well drained to excessively drained. The surface and subsoil layers are loamy or clayey and may contain up to 60 percent rock fragments by volume. Available water holding capacity of the soil is 2.0 to 3.75 inches. In the upper 12 inches of soil, the pH ranges from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and the calcium carbonate equivalent ranges from 5 to 15 percent. Depth to a water table during the growing season is more than 5 feet.

This group is poorly suited for windbreaks and environmental plantings. The amount of carbonates, high pH, and the droughtiness of the soil significantly limit the selection and rate of growth of trees and shrubs. Providing permanent supplemental water is recommended for successful establishment and growth of trees and shrubs.

Windbreak suitability group 6KK.—The soils in this group are moderately deep over sand, gravel, and similar layers with a water permeability of more than 20 inches per hour or other layers restrictive to roots. They are well drained to excessively drained. The surface and subsoil layers are loamy or clayey and may contain up to 60 percent rock fragments by volume. Available water holding capacity of the soil is 2.0 to 3.75 inches. In the upper 12 inches of soil, the pH ranges from 7.9 to 8.4, the electrical conductivity is less than 4 millimhos per centimeter, and the calcium carbonate equivalent ranges from 15 to 40 percent. Depth to a water table during the growing season is more than 5 feet.

This group is poorly suited for windbreaks and environmental plantings. The very high amount of carbonates, high pH, and the droughtiness of the soil significantly limit the selection and rate of growth of trees and shrubs. Providing permanent supplemental water is recommended for successful establishment and growth of trees and shrubs.

Windbreak suitability group 7.—The soils in this group are very deep or deep and well drained to excessively drained. These soils are sandy and have less than 35 percent rock fragments by volume throughout. Available water capacity of the soil is more than 2 inches but commonly less than 5 inches. In the upper 12 inches of the soil the calcium carbonate equivalent is less than 5 percent, the pH is less than 7.9, and the electrical conductivity is less than 2 millimhos per centimeter. Depth to a water table during the growing season is more than 5 feet.

This group is poorly suited to windbreaks in areas where supplemental watering is not practical. The droughtiness of the soil significantly limits the selection and rate of growth of trees and shrubs. Providing permanent supplemental water is recommended for successful establishment and growth of trees and shrubs. Wind erosion at or near the planting site can adversely limit the health and vigor of young windbreaks. The sandy soil surface layer requires specialized site preparation, planting methods, and management to ensure successful tree and shrub plantings.

Windbreak suitability group 8.—The soils in this group are very deep or deep and moderately well drained to well drained. They have loamy surface and subsoil layers and have less than 35 percent rock fragments by volume throughout. Available water capacity of the soil is more than 7.5 inches. In the upper 12 inches of the soil the calcium carbonate equivalent is 5 to 15 percent, the pH is 7.9 to 8.4, and the electrical conductivity is up to 4 millimhos per centimeter. Depth to a water table during the growing season is more than 5 feet.

This group is moderately well suited for windbreaks and environmental plantings. The amount of carbonates and high pH in the soil slightly limit the selection and rate of growth of trees and shrubs.

Windbreak suitability group 8K.—The soils in this group are very deep or deep and moderately well drained to well drained. They have loamy surface and subsoil layers and have less than 35 percent rock fragments by volume throughout. Available water capacity of the soil is more than 7.5 inches. In the upper 12 inches of soil, the pH ranges from 7.9 to 8.4, the electrical conductivity is up to 4 millimhos per centimeter, and the calcium carbonate equivalent ranges from 15 to 40 percent. Depth to a water table during the growing season is more than 5 feet.

This group is poorly suited for windbreaks and environmental plantings. The very high amount of carbonates and high pH in the soil significantly limit the selection and rate of growth of trees and shrubs.

Windbreak suitability group 9C.—The soils in this group are moderately deep to very deep and moderately well drained to well drained. Typically, these soils are clayey and have less than 35 percent rock fragments by volume throughout. However, the upper 8 inches be loamy. Available water capacity of the soil to underlying bedrock or other restrictive layers is more than 3.75 inches but commonly less than 7.5 inches. In the upper 12 inches of the soil the electrical conductivity ranges from 4 to 16 millimhos per centimeter. Depth to a water table during the growing season is more than 5 feet.

This group is poorly suited for windbreaks and environmental plantings. The high pH and low to moderate

salinity in the soil significantly limit the selection and rate of growth of trees and shrubs.

Windbreak suitability group 9L.—The soils in this group are moderately deep to very deep and moderately well drained to well drained. They have loamy surface layers. The subsoil is loamy or clayey. If the subsoil is clayey, the soil has a loamy surface layer 8 inches or more thick. These soils have less than 35 percent rock fragments by volume throughout. Available water capacity of the soil to underlying bedrock or other restrictive layers is more than 3.75 inches but commonly less than 7.5 inches. In the upper 12 inches of the soil the electrical conductivity ranges from 4 to 16 millimhos per centimeter. Depth to a water table during the growing season is more than 5 feet.

This group is poorly suited for windbreaks and environmental plantings. The high pH and low to moderate salinity in the soil significantly limit the selection and rate of growth of trees and shrubs.

Windbreak suitability group 9W.—The soils in this group are poorly drained to moderately well drained and moderately deep to very deep. These soils range from sandy to clayey. In the upper 12 inches of soil, the electrical conductivity ranges from 4 to 16 millimhos per centimeter. Depth to a water table during the growing season ranges from 1.5 to 5 feet.

This group is poorly suited for windbreaks and environmental plantings. The high pH and low to moderate salinity in the soil significantly limit the selection and rate of growth of trees and shrubs. Planting may be delayed for a short period in spring because of wetness.

Windbreak suitability group 10.—The soils in this group have one or more characteristics that are severely limiting to the planting and growth of trees and shrubs. Among these characteristics are: the soil depth is shallow; available water capacity of the soil to underlying bedrock or other restrictive layers is less than 2 inches; the calcium carbonate equivalent is more than 40 percent or the electrical conductivity is more than 16 millimhos per centimeter in the upper 12 inches of the soil; or a water table during the growing season is within 18 inches of the soil surface.

This group is not usually recommended for windbreaks and environmental plantings. However, onsite investigations may reveal that some tree and shrub plantings can be made with special treatments. The selection of species must be tailored to the soil conditions at the site.

The windbreak planting zones used in this survey area are described in the following paragraphs.

Planting Zone I includes areas of soils with a mean annual soil temperature from 47 degrees F to 59 degrees F.

Planting Zone II includes areas of soils with a mean annual soil temperature of less than 47 degrees F, a mean summer soil temperature of more than 59 degrees F, and precipitation of 10 to 14 inches. In the winter this zone is characterized by frequent periods of cold, dry winds and soil surfaces that are frequently blown free of snow.

Planting Zone III includes areas of soils with a mean annual soil temperature of less than 47 degrees F, a mean summer soil temperature of less than 59 degrees F, and precipitation of 15 or more inches. This zone is characterized by a snowpack throughout most of the winter.

Recreation

The soils of the survey area are rated in table 10 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 10, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in table 10 can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in table 11 and interpretations for septic tank absorption fields in table 12.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best

soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Wildlife Habitat

Soils influence wildlife populations primarily through the types of habitat produced. Studies dating back to the 1940's show wildlife productivity directly related to soil fertility. The abundant populations of wildlife encountered by early settlers and planners were found on the best soils in a given ecological zone. While it is true some species of wildlife can be produced on all soils, it is also generally true that wildlife productivity is a function of the biotic potential of the soil. The quantity and quality of most vegetative wildlife habitat elements will not exceed the capability of the soil resource, unless artificially supplied through intensive management systems.

Most wildlife habitat are created, improved, or maintained by planting suitable vegetation, manipulating existing vegetation, inducing natural establishment of desired plants, or by combinations of such measures. The behavior of soils can be predicted from knowledge of their properties. The growth habits and characteristics of plants that comprise wildlife habitat are affected by such behavior. From the appraisal of these vegetative habitat elements, the suitability of a site for various types of wildlife can be approximated.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

The descriptions of the general soil map units list the representative wildlife species known to occur in the general soil map unit. Wildlife habitat information was taken from the various maps and reports published by the Wyoming Game and Fish Department, other governmental agencies, and private companies.

Information is provided in this report on the capability of the soils to support irrigated and nonirrigated crops and native range plants. This report also includes windbreak and forestry interpretations. Information on the existing and potential plant communities will enable the user to select sites for habitat management. The user can determine the intensity of plant community management needed to produce satisfactory results.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock,

hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, potential for frost action, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or

maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site.

Landfills must be able to bear heavy vehicular traffic. They involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect a landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair*, or *poor*as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site

features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series and soil family descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and

special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage and irrigation.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground- water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features listed in tables are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series and soil family under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 15.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074

millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of the soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are

low, a change of less than 3 percent; *moderate,* 3 to 6 percent; and *high,* more than 6 percent; and *very high,* greater than 9 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, very fine sand, sand, and organic matter (up to 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. Crops can be grown if measures to control wind erosion are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can easily be grown if ordinary measures to control wind erosion are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of very deep or deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep to very deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after

rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, or frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

A *Cemented pan* is a cemented or indurated subsurface layer within a depth of 5 feet. Such a pan causes difficulty in excavation. Pans are classified as thin or thick. A *thin* pan is sufficiently thin that excavations can be made by backhoes or small rippers but not trenching machines. A *thick* pan is so thick or massive that blasting or special equipment is needed in excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Table 18 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

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Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (U.S. Dep. Agric., 1975). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 19 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol.* An example is Aridisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Argid (*Arg,* meaning having an argillic horizon, plus *id,* from Aridisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplargid (*Hapl,* meaning minimal horizonation, plus *argid,* the suborder of the Aridisols that has an argillic horizon).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, Borollic Haplargids.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series. The Alcova series is an example of a fine-loamy, mixed, Borollic Haplargid.

Soil Series and Their Morphology

In this section, each soil series or soil family recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (U.S. Dep. Agric., 1993). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (U.S. Dep. Agric., 1975). Unless otherwise stated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Aberone Series

The Aberone series consists of very deep, well drained soils on dissected fan terraces. They formed in alluvium. Slope ranges from 0 to 15 percent. Elevation is 5,500 to 6,000 feet, average annual precipitation is 12 to 14 inches, and average annual air temperature is 45 to 49 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Aberone soil, in an area of Aberone gravelly sandy loam, 0 to 15 percent slopes,

500 feet west, 500 feet south of the northeast corner of sec. 31, T. 22 N., R. 70 W.

A—0 to 8 inches; brown (7.5YR 4/2) gravelly sandy loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; 15 percent fine gravel; slightly alkaline; clear smooth boundary.

Bk1—8 to 15 inches; pinkish gray (7.5YR 6/2) very gravelly sandy loam, brown (7.5YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine pores; violently effervescent, calcium carbonate is disseminated and also occurs as thin pendants on rock fragments; 35 percent fine gravel; moderately alkaline; gradual wavy boundary.

Bk2—15 to 60 inches; very pale brown (10YR 7/3) extremely gravelly coarse sandy loam, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; violently effervescent, calcium carbonate is disseminated and also occurs as common thin pendants on rock fragments; 20 percent cobbles and 50 percent gravel; moderately alkaline.

The Bk horizon has a moderately alkaline or strongly alkaline reaction. The calcium carbonate equivalent in this horizon is 40 to 55 percent.

Abston Series

The Abston series consists of moderately deep, well drained soils on hillslopes and terrace escarpments. They formed in residuum and local alluvium derived from shale. Slope ranges from 5 to 25 percent. Elevation is 6,800 to 7,000 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Abston loam, in an area of Abston-Bullock complex, 5 to 25 percent slopes, 650 feet east, 900 feet south of the northwest corner of sec. 28, T. 19 N., R. 76 W.

A—0 to 2 inches; dark yellowish brown (10YR 4/4) loam, brown (10YR 4/3) moist; moderate very fine granular structure; soft, very friable, slightly sticky and plastic; many fine and common medium roots; common very fine constricted random vesicular pores; slightly alkaline; abrupt smooth boundary.

Btn1—2 to 3 inches; dark yellowish brown (10YR 4/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, sticky and very plastic; many fine and common medium roots; few very fine constricted irregular pores; few prominent clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated; strongly alkaline; abrupt smooth boundary.

Btn2—3 to 18 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong very coarse prismatic structure parting to strong coarse subangular blocky; very hard, firm, very sticky and very plastic; many fine and common medium roots; few very fine constricted irregular pores; common prominent clay films on faces of peds and in root channels; slightly effervescent, calcium carbonate is disseminated; very strongly alkaline; clear wavy boundary.

Bk—18 to 25 inches; yellowish brown (10YR 5/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; strong very coarse prismatic structure; very hard, firm, very sticky and very plastic; few very fine constricted irregular pores; slightly effervescent, calcium carbonate is disseminated; very strongly alkaline; gradual wavy boundary.

Cr—25 to 60 inches; weakly consolidated calcareous sodic shale.

The depth to bedrock ranges from 20 to 40 inches. Reaction is neutral or slightly alkaline in the A horizon, and strongly alkaline or very strongly alkaline in the B horizons. The B horizons have textures of clay loam, silty clay loam, or clay. Electrical conductivity in the B horizons is 2 to 8 millimhos per centimeter.

Alcova Series

The Alcova series consists of very deep, well drained soils on alluvial fans and terraces. They formed in alluvium. In some areas, the alluvium overlies residuum derived from redbed sandstone. Slope ranges from 0 to 10 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Alcova sandy loam, in an area of Alcova-Borollic Camborthids complex, 0 to 8 percent slopes, 700 feet east, 2,640 feet north of the southwest corner of sec. 35, T. 17 N., R. 74 W.

A—0 to 3 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and common medium roots; moderately alkaline; abrupt smooth boundary.

Bt—3 to 15 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure parting to strong medium subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; many faint and few prominent clay films on

faces of peds; moderately alkaline; clear smooth boundary.

Bk—15 to 37 inches; very pale brown (10YR 7/3) sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, sticky and slightly plastic; few fine and medium roots; violently effervescent, calcium carbonate is disseminated; strongly alkaline; gradual wavy boundary.

2Bk—37 to 60 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and nonplastic; strongly effervescent, calcium carbonate is disseminated and also occurs as coatings on rock fragments; 40 percent gravel; strongly alkaline.

The surface is 0 to 40 percent covered with gravel. The A and Bt horizons have slightly alkaline or moderately alkaline reactions. The Bk and 2Bk horizons have moderately alkaline or strongly alkaline reactions.

The Bt horizon is 0 to 30 percent gravel. It has a texture of clay loam, sandy clay loam, or gravelly sandy clay loam. The Bk horizon has a texture of sandy clay loam or clay loam. This horizon is absent in some pedons. The 2Bk horizon has a texture of very gravelly sandy clay loam, very gravelly loam, very gravelly sandy loam, or extremely gravelly sandy loam. This horizon is 40 to 60 percent gravel and 0 to 10 percent cobbles. The depth to the 2Bk horizon ranges from 16 to 37 inches.

Alderon Series

The Alderon series consists of moderately deep, well drained soils on foothills and mountain slopes. They formed in colluvium and residuum derived dominantly from granite. Slope ranges from 5 to 50 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Alderon sandy loam, in an area of Rock outcrop-Cathedral-Alderon complex, 25 to 50 percent slopes, 600 feet north, 1,100 feet east of the southwest corner of sec. 14, T. 21 N., R. 71 W.

Oi— 2 inches to 1; undecomposed forest litter.

Oe— 1 inch to 0; decomposed needles, twigs, and bark.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) sandy loam, very dark brown (10YR 2/2) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; common fine and medium, and few coarse roots; 10 percent gravel; neutral; abrupt wavy boundary.

E—2 to 7 inches; light brown (7.5YR 6/4) sandy clay loam, dark brown (7.5YR 4/4) moist; weak fine platy structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium, and few coarse roots; 10 percent gravel; neutral; abrupt smooth boundary.

Bt—7 to 26 inches; yellowish red (5YR 4/6) gravelly sandy clay loam, reddish brown (5YR 4/4) moist; strong coarse and medium subangular blocky structure; hard, firm, sticky and plastic; few medium and coarse roots; few prominent clay films on faces of peds; 30 percent gravel; neutral; clear wavy boundary.

C—26 to 39 inches; brown (7.5YR 4/4) very gravelly coarse sandy loam, dark brown (7.5YR 3/4) moist; single grain; loose, nonsticky and nonplastic; few coarse roots; 45 percent gravel; neutral; clear wavy boundary.

Cr—39 inches; weakly consolidated granite.

The depth to bedrock ranges from 20 to 40 inches. The hue is 7.5YR or 10YR in the E and C horizons, and 5YR through 10YR in the Bt horizon. The E horizon has a texture of sandy clay loam or gravelly sandy loam; it is 10 to 25 percent gravel. The Bt horizon is 20 to 35 percent gravel. The C horizon has a texture of very gravelly sandy loam or very gravelly coarse sandy loam; it is 40 to 50 percent gravel. Reaction in the C horizon is neutral or slightly alkaline.

Almy Series

The Almy series consists of very deep, well drained soils on alluvial fan aprons, foot slopes, and dip slopes. They formed in alluvium and residuum derived from reddish sandstone and shale. Slope ranges from 0 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Almy soil, in an area of Almy loam, 0 to 8 percent slopes, 300 feet east, 1,150 feet south of the northwest corner of sec. 3, T. 12 N., R. 75 W.

A—0 to 2 inches; reddish brown (5YR 4/4) loam, dark reddish brown (5YR 3/4) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and few medium roots; moderately alkaline; abrupt smooth boundary.

Bt—2 to 11 inches; reddish brown (5YR 4/4) loam, dark reddish brown (5YR 3/4) moist; moderate medium columnar structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine and few medium roots; common distinct clay films on faces of peds; slightly effervescent; moderately alkaline; clear smooth boundary.

Btk—11 to 22 inches; reddish yellow (5YR 6/6) loam, yellowish red (5YR 4/5) moist; weak medium columnar structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common distinct clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine irregular soft masses; strongly alkaline; clear smooth boundary.

Bk1—22 to 35 inches; yellowish red (5YR 5/5) sandy clay loam, reddish brown (5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; violently effervescent, calcium carbonate is disseminated and also occurs as few fine irregular soft masses and as thin coatings and pendants on rock fragments; 5 percent cobbles; moderately alkaline; clear smooth boundary.

Bk2—35 to 60 inches; yellowish red (5YR 5/5) sandy loam, reddish brown (5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few fine roots; violently effervescent, calcium carbonate is disseminated and also occurs as few fine irregular soft masses and concretions; 5 percent gravel and cobbles; strongly alkaline.

The A horizon has hue of 5YR or 7.5YR. Reaction in the A and Bt horizons is slightly alkaline or moderately alkaline. The Bt horizon commonly has a texture of loam, but in some pedons it is sandy clay loam. The Bk horizon has a texture of sandy clay loam, loam, very fine sandy loam, or sandy loam. It has a moderately alkaline or strongly alkaline reaction. The Bk horizon is 0 to 5 percent gravel and 0 to 5 percent cobbles.

Alogia Series

The Alogia consists of very deep, moderately well drained soils in drainageways and on alluvial fans and stream terraces. They formed in alluvium from reddish sandstone and shale. Slope ranges from 0 to 3 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Alogia soil, in an area of Alogia loam, 0 to 3 percent slopes, 2,600 feet north, 2,150 feet east of the southwest corner of sec. 32, T. 15 N., R. 73 W.

A—0 to 3 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/3) moist; weak thin platy structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; abrupt smooth boundary.

Bt—3 to 7 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/3) moist; moderate medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common fine and medium roots; few prominent clay films in pores and root channels; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Btk1—7 to 15 inches; light reddish brown (5YR 6/3) clay loam, reddish brown (5YR 4/3) moist; moderate medium and fine subangular blocky structure; soft, friable, sticky and plastic; few fine roots; common faint clay films on faces of peds; violently effervescent, calcium carbonate is disseminated and the calcium carbonate equivalent is 13 percent; few fine soft masses of gypsum; strongly alkaline; clear smooth boundary.

Btk2—15 to 21 inches; light reddish brown (5YR 6/4) clay loam, reddish brown (5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, sticky and plastic; few fine roots; few faint clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated and the calcium carbonate equivalent is 17 percent; few fine soft masses of gypsum; moderately alkaline; gradual smooth boundary.

Bky1—21 to 31 inches; pink (7.5YR 7/4) loam, brown (7.5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; violently effervescent, calcium carbonate is disseminated and the calcium carbonate equivalent is 8 percent; many fine and medium soft masses of gypsum; moderately alkaline; gradual smooth boundary.

Bky2—31 to 41 inches; pink (5YR 7/3) loam, reddish brown (5YR 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; violently effervescent, calcium carbonate is disseminated and the calcium carbonate equivalent is 15 percent); many fine and medium soft masses of gypsum; moderately alkaline; gradual smooth boundary.

2Cy—41 to 50 inches; reddish brown (2.5YR 5/4) clay loam, dark reddish brown (2.5YR 3/4) moist; massive; slightly hard, friable, sticky and plastic; strongly effervescent, calcium carbonate is disseminated and the calcium carbonate equivalent is 5 percent; common fine soft masses of gypsum; moderately alkaline; gradual smooth boundary.

2C—50 to 60 inches; reddish yellow (5YR 6/6) clay loam, reddish brown (5YR 4/4) moist; massive; very hard, firm, sticky and plastic; strongly effervescent, calcium carbonate is disseminated; few fine soft masses of gypsum; slightly alkaline.

The depth to a seasonal high water table ranges from 3.0 to 5.0 feet from April through July. The hue is 5YR or

7.5YR in the A and B horizons, and 2.5YR or 5YR in the 2C horizon. Electrical conductivity is 2 to 8 millimhos per centimeter in the Bt horizon, and 4 to 8 millimhos per centimeter in the Bk and 2C horizons. Reaction is slightly alkaline or moderately alkaline in the A and 2C horizons, and moderately alkaline or strongly alkaline in the B horizons.

The Bt horizon commonly has a texture of clay loam, but in some pedons it is loam or silty clay loam. The Bk horizon has a texture of loam or silt loam. Calcium carbonate equivalent in this horizon is 15 to 20 percent. The Bk horizon is 10 to 20 percent gypsum. The 2C horizon has a texture of clay loam, loam, or silt loam. Calcium carbonate equivalent in this horizon is 5 to 20 percent. The C horizon is 10 to 20 percent gypsum.

Amesmont Series

The Amesmont series consists of moderately deep, well drained soils on foothills and mountain slopes. They formed in residuum and colluvium derived from granite. Slope ranges from 3 to 20 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Amesmont fine sandy loam. in an area of Hapjack-Rogert-Amesmont complex, 3 to 25 percent slopes, 2,000 feet east, 90 feet north of the southwest corner of sec. 24, T. 14 N., R. 72 W.

A—0 to 5 inches; brown (10YR 4/3) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; less than 5 percent gravel; neutral; abrupt smooth boundary.

Bt1—5 to 14 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; weak medium prismatic structure parting to moderate coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; many faint and few distinct clay films on faces of peds; 10 percent gravel; neutral; clear smooth boundary.

Bt2—14 to 20 inches; brown (7.5YR 5/4) gravelly sandy clay loam, dark brown (7.5YR 3/4) moist; weak coarse and moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common distinct clay films on faces of peds; 20 percent gravel; neutral; gradual wavy boundary.

C—20 to 33 inches; strong brown (7.5YR 4/6) very gravelly sandy clay loam, strong brown (7.5YR 4/6) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; 40 percent gravel; neutral; gradual wavy boundary.

Cr—33 inches; highly weathered granite saprolith.

The surface is 10 to 30 percent covered with fine gravel. The depth to bedrock ranges from 20 to 40 inches. The particle-size control section is 20 to 30 percent clay and 35 to 50 percent fine or coarser sand. Reaction is neutral or slightly alkaline throughout the profile.

The A horizon is 0 to 15 percent gravel. The Bt horizon has hue of 5YR or 7.5YR; it has a texture of sandy clay loam or gravelly sandy clay loam. The Bt horizon is 10 to 30 percent gravel. The C horizon has a texture of very gravelly sandy clay loam, very gravelly sandy loam, or very gravelly loamy sand; it is 35 to 60 percent gravel.

Anchutz Series

The Anchutz series consists of very deep, well drained soils on fan terraces. They formed in alluvium. Slope ranges from 1 to 8 percent. Elevation is 6,800 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Anchutz soil, in an area of Anchutz sandy loam, 1 to 8 percent slopes, 2,900 feet north, 35 feet west of the southeast corner of sec. 17, T. 19 N., R. 77 W.

A—0 to 2 inches; brown (10YR 5/3) sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; moderately alkaline; abrupt smooth boundary.

Bt1—2 to 10 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly plastic and sticky; common fine roots to a depth of 6 inches, few fine roots at a depth of 6 to 10 inches; common distinct clay films on faces of peds; moderately alkaline; clear smooth boundary.

Bt2—10 to 15 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly plastic and sticky; few fine roots; common distinct clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; gradual smooth boundary.

Bk1—15 to 31 inches; very pale brown (10YR 7/3) clay loam, light yellowish brown (10YR 6/4) moist; weak fine subangular blocky structure; hard, firm, slightly plastic and sticky; few fine roots; violently effervescent, calcium carbonate is disseminated and also occurs as many medium soft masses, 20 percent

calcium carbonate equivalent by calcimeter method; strongly alkaline; gradual smooth boundary.

Bk2—31 to 39 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly plastic and sticky; few fine roots; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses, 9 percent calcium carbonate equivalent by calcimeter method; 5 percent gravel; strongly alkaline; gradual wavy boundary.

Bk3—39 to 60 inches; light yellowish brown (10YR 6/4) sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; slightly effervescent, calcium carbonate is disseminated; strongly alkaline.

The particle-size control section is 20 to 30 percent clay. The A and Bt horizons have slightly alkaline or moderately alkaline reactions. The Bk horizon has a texture of sandy clay loam or clay loam in the upper part and sandy loam or sandy clay loam in the lower part. In some parts of this horizon above a depth of 40 inches, the calcium carbonate equivalent is 15 to 25 percent.

Ansel Series

The Ansel series consists of very deep, well drained soils on foothills and mountain alluvial fans. They formed in alluvium derived from igneous and metamorphic rock. Slope ranges from 6 to 45 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Ansel gravelly sandy loam, 6 percent slope, in a area of Ansel-Granile gravelly sandy loams, 6 to 45 percent slopes, 500 feet north, 600 feet west of the southeast corner of sec. 13, T. 14 N, R. 78 W.

Oi—2 inches to 0; pine needlesand bark residue.

E—0 to 6 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak platy structure parting to moderate medium subangular blocky; soft, very friable, nonsticky and nonplastic; common medium and fine roots; 20 percent gravel; neutral; abrupt smooth boundary.

Bt1—6 to 18 inches; light brown (7.5YR 6/4) gravelly sandy clay loam, brown (7.5YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and fine roots; many distinct clay films on faces of peds; 25 percent gravel; neutral; abrupt wavy boundary.

Bt2—18 to 24 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and fine roots; common faint clay films on faces of peds; 20 percent gravel; neutral; clear wavy boundary.

C—24 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; 40 percent gravel; neutral.

The Bt horizon is 25 to 35 percent clay and 15 to 30 percent gravel. The C horizon is 35 to 50 percent gravel.

Bateson Series

The Bateson series consists of very deep, well drained soils on knobs and breaks of the dissected pediments to the Laramie Range. They formed in alluvium overlying residuum derived dominantly from tuffaceous conglomerate. Slope ranges from 8 to 15 percent. Elevation is 7,200 to 7,500 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Bateson gravelly sandy clay loam, in an area of Bateson-Shirleybasin association, 1 to 15 percent slopes, 750 feet south, 625 feet west of the northeast corner of sec. 17, T. 27 N., R. 76 W.

A—0 to 2 inches; brown (10YR 5/3) gravelly sandy clay loam, brown (10YR 4/3) moist; moderate fine and medium granular structure; soft, friable, sticky and plastic; many very fine roots; the surface is 25 percent covered with gravel; neutral; clear wavy boundary.

Bt1—2 to 10 inches; brown (7.5YR 5/4) gravelly sandy clay loam, dark brown (7.5YR 4/4) moist; weak coarse prismatic structure parting to moderate coarse subangular blocky; hard, firm, sticky and plastic; many very fine roots; common faint clay films on faces of peds and on gravel; 25 percent fine gravel; slightly alkaline; clear wavy boundary.

Bt2—10 to 21 inches; dark brown (7.5YR 4/4) gravelly sandy clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common very fine roots; few faint clay films on faces of peds; 30 percent fine gravel; slightly alkaline; clear wavy boundary.

Bk1—21 to 29 inches; red (2.5YR 5/6) very gravelly sandy loam, red (2.5YR 4/6) moist; massive; soft, friable, slightly sticky and nonplastic; few very fine roots; 60 percent fine gravel; strongly effervescent, calcium carbonate as common fine threads and as pendants on gravel; slightly alkaline; clear wavy boundary.

Bk2—29 to 60 inches; pink (5YR 7/3) very gravelly loamy sand, reddish brown (5YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; strongly

effervescent, calcium carbonate is disseminated and also occurs as many large irregular seams and as pendants on gravel; 60 percent fine gravel; strongly alkaline.

Reaction is slightly alkaline or moderately alkaline reaction in the Bk1 horizon, and moderately alkaline or strongly alkaline in the Bk2 horizon.

Blackhall Series

The Blackhall series consists of shallow, well drained soils on ridges and hillslopes. They formed in residuum and colluvium derived from sandstone. Slope ranges from 5 to 45 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Blackhall sandy loam, in an area of Blackhall-Satanka-Rock outcrop complex, 5 to 20 percent slopes, 1,900 feet west, 300 feet south of the northeast corner of sec. 1, T. 14 N., R. 74 W.

A—0 to 2 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; moderate coarse platy structure parting to moderate medium granular; slightly hard, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; the surface is 20 percent covered with channery fragments; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bw—2 to 9 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine and medium roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

C—9 to 16 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few medium roots; slightly effervescent, calcium carbonate is disseminated; 13 percent gravel; moderately alkaline.

Cr—16 inches; weakly consolidated sandstone.

The surface is 20 to 40 percent covered with gravel, channers, stones, or flagstones. The depth to bedrock ranges from 10 to 20 inches. The particle-size control section is 5 to 15 percent clay and 0 to 15 percent rock fragments. The Bw horizon is not a cambic horizon, and it is absent in some pedons.

The A horizon is 0 to 45 percent gravel. It has a slightly alkaline or moderately alkaline reaction. The C horizon has a texture of fine sandy loam or sandy loam; it is 0 to 15 percent gravel. The C horizon is 0 to 40 percent soft sandstone fragments that break down when moistened and rubbed.

Blazon Series

The Blazon series consists of very shallow or shallow and well drained soils on hills, ridges, fan terraces, and escarpments. They formed in residuum and colluvium derived from shale, loamstone, and sandstone. Slope ranges from 1 to 45 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 17 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Blazon clay loam, in an area of Chaperton, moderately saline-Blazon complex, 8 to 20 percent slopes, 2,250 feet south, 100 feet east of the northwest corner of sec. 20, T. 21 N., R. 74 W.

A—0 to 2 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky and plastic; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bw—2 to 7 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and plastic; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

C—7 to 16 inches; light yellowish brown (2.5Y 6/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, sticky and plastic; strongly effervescent, carbonate disseminated and also occurs as common fine seams along weathering planes; common fine iron and sulphur oxide concentrations; moderately alkaline; clear smooth boundary.

Cr1—16 to 22 inches; weakly consolidated shale with a few fine gypsum crystals.

Cr2—22 inches; soft shale with 1/4-inch-thick layers of medium and fine gypsum crystals every 4 to 6 inches along bedding planes. The surface is 0 to 15 percent covered with quartzitic gravel and fine cobbles. The depth to bedrock ranges from 8 to 20 inches. The hue is 10YR to 5Y throughout the profile. Reaction is moderately alkaline or strongly alkaline throughout the profile. The Bw horizon is not a cambic horizon and is absent in some pedons.

Bonjea Series

The Bonjea series consists of shallow, well drained soils on foothills and mountain slopes. They formed in

residuum and colluvium derived from granite and gneiss. Slope ranges from 3 to 60 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Bonjea sandy loam, in an area of Bonjea-Chugcreek-Rock outcrop complex, 3 to 15 percent slopes, 1,500 feet south, 2,300 feet east of the northwest corner of sec. 10, T. 18 N., R. 71 W.

A—0 to 4 inches; brown (10YR 4/3) sandy loam, dark brown (10YR 3/3) moist; weak fine and medium granular structure; soft, very friable, nonsticky and nonplastic; common fine and medium roots; 5 percent gravel; neutral; abrupt smooth boundary.

Bt1—4 to 10 inches; brown (10YR 4/3) sandy clay loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; many faint clay films on faces of peds; 5 percent fine gravel; neutral; clear smooth boundary.

Bt2—10 to 15 inches; yellowish brown (10YR 5/6) gravelly sandy clay loam, dark yellowish brown (10YR 4/6) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common medium roots; many distinct clay films on faces of peds; 20 percent gravel; neutral; abrupt broken boundary.

R—15 inches; hard granite.

The depth to bedrock ranges from 10 to 20 inches. The particle-size control section is 20 to 30 percent clay and 35 to 50 percent fine or coarser sand. The particle-size control section averages 10 to 35 percent gravel. Reaction is neutral or slightly alkaline throughout the profile. The hue is 7.5YR or 10YR in the A horizon, and 2.5Y to 7.5YR in the Bt horizon. The Bt horizon has a dominant texture of sandy clay loam or gravelly sandy clay loam, but the lower part in some pedons is very gravelly sandy clay loam.

Bosler Series

The Bosler series consists of very deep, moderately well drained or well drained soils on alluvial fans and terraces. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Bosler fine sandy loam, in an area of Bosler-Borollic Camborthids complex, 0 to 8 percent slopes, 1,660 feet south, 330 feet west of the northeast corner of sec. 12, T. 15 N., R. 74 W.

A—0 to 4 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; 10 percent gravel; neutral; clear smooth boundary.

AB—4 to 7 inches; grayish brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; 5 percent gravel; slightly alkaline; clear smooth boundary.

Bt—7 to 15 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, sticky and plastic; common fine roots; common distinct clay films on faces of peds; 5 percent gravel; slightly alkaline; clear smooth boundary.

Btk—15 to 19 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, friable, sticky and slightly plastic; few fine roots; few distinct clay films in pores and on faces of peds; violently effervescent, calcium carbonate as common fine and medium soft masses, as common fine filaments, and as coatings on gravel; 10 percent gravel; moderately alkaline; gradual wavy boundary.

Bk—19 to 30 inches; very pale brown (10YR 8/3) loam, pale brown (10YR 6/3) moist; massive; hard, very friable, slightly sticky and slightly plastic; violently effervescent, calcium carbonate as many fine, medium and large soft masses, and as thick coatings on gravel; 10 percent gravel; moderately alkaline; abrupt smooth boundary.

2C—30 to 60 inches; very pale brown (10YR 7/4) very gravelly sand, light yellowish brown (10YR 6/4) moist; single grain; loose; nonsticky and nonplastic; slightly effervescent in some strata, noneffervescent in others; 40 percent fine and medium granitic and quartzitic gravel; moderately alkaline.

The depth to secondary calcium carbonate ranges from 5 to 17 inches. The particle-size control section commonly is 20 to 30 percent clay, 35 to 50 percent fine or coarser sand, and 0 to 10 percent rock fragments. The The depth to the 2C horizon ranges from 20 to 40 inches. In map units 119 and 121, a seasonal high water table is at a depth of 1.5 to 3.0 feet from April through September.

The A horizon is 0 to 10 percent gravel. It commonly has a neutral or slightly alkaline reaction. The Bt horizon commonly has a slightly alkaline or moderately alkaline reaction. In the wet phase, however, the A and Bt

horizons have moderately alkaline or strongly alkaline reactions. The Bt horizon is 0 to 10 percent gravel.

The Bk horizon has texture of loam or sandy clay loam and is 10 to 15 percent gravel. This horizon is absent in some pedons. The 2C and 2Bk horizons have textures of very gravelly sand or very gravelly loamy sand. They are 35 to 60 percent gravel. Reaction in the Bk, 2Bk, and 2C horizons is moderately alkaline or strongly alkaline. Calcium carbonate equivalent in the Bk and 2Bk horizons is 15 to 35 percent. The depth to the 2Bk or 2C horizon is 20 to 40 inches.

Bowen Series

The Bowen series consists of moderately deep, well drained soils on mountain slopes and mountain toe slopes. They formed in alluvium and colluvium derived from schist and gneiss. Slope ranges from 10 to 20 percent. Elevation is 7,600 to 8,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Bowen gravelly sandy loam, in an area of Poin-Bowen-Rock outcrop complex, 10 to 50 percent slopes, 1,690 feet south, 1,700 feet west of the northeast corner of sec. 25, T. 13 N., R. 77 W.

A—0 to 8 inches; brown (10YR 4/3) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; the surface is 20 percent covered with gravel and cobbles; neutral; clear smooth boundary.

Bt1—8 to 16 inches; dark yellowish brown (10YR 4/4) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; weak fine subangular block structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; few faint clay films on faces of peds and as bridging between sand grains; 45 percent gravel and 10 percent cobbles; neutral; clear wavy boundary.

Bt2—16 to 22 inches; brown (10YR 5/3) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common fine roots; few faint clay films on faces of peds and as bridging between sand grains; 35 percent gravel and 10 percent cobbles; slightly alkaline; gradual wavy boundary.

C—22 to 31 inches; brown (10YR 5/3) very cobbly sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine roots; 20 percent gravel and 40 percent cobbles; slightly alkaline; clear wavy boundary.

R—31 inches; hard schist.

The depth to bedrock ranges from 20 to 40 inches. The particle-size control section averages 18 to 25 percent clay. The Bt horizon has a dominant texture of very gravelly sandy clay loam, but a thin layer of very gravelly sandy loam is present in some pedons. Reaction in the Bt horizon is neutral or slightly alkaline. The C horizon has a texture of very gravelly sandy loam or very cobbly sandy loam.

Boyle Series

The Boyle series consists of shallow, well drained soils on foothills and mountain slopes. They formed in residuum and colluvium derived from granite. Slope ranges from 1 to 25 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Boyle gravelly sandy loam, in an area of Boyle-Lininger association, 1 to 15 percent slopes, 400 feet east, 500 feet south of the northwest corner of sec. 11, T. 13 N., R. 71 W.

A—0 to 3 inches; brown (10YR 4/3) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine and common medium roots; 20 percent gravel; neutral; clear smooth boundary.

Bt1—3 to 6 inches; brown (10YR 4/3) gravelly sandy clay loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure parting to moderate medium granular; slightly hard, very friable, sticky and slightly plastic; common very fine, fine, and medium roots; many faint and few distinct clay films on faces of peds; 30 percent gravel; neutral; clear smooth boundary.

Bt2—6 to 12 inches; brown (7.5YR 4/4) very gravelly sandy clay loam, dark brown (7.5YR 3/2) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common fine and medium roots; many faint and few distinct clay films on faces of peds; 50 percent gravel; neutral; clear wavy boundary.

Cr—12 inches; weakly consolidated granite.

The surface is 30 to 70 percent covered with gravel and a few stones. The hue is 10YR or 7.5YR throughout the profile. The particle-size control section averages 20 to 28 percent clay. The depth to bedrock commonly is 10 to 20 inches. In the thin solum Boyle soil found in map unit 123, however, the bedrock is at a depth of 7 to 10

inches; this is outside the characteristics of the Boyle series.

The A horizon is 15 to 30 percent gravel. The Bt horizon commonly has a texture of very gravelly sandy clay loam, but a thin layer of gravelly sandy clay loam is present in some pedons. The content of gravel in the Bt horizon averages 35 to 50 percent. A C horizon is present in some pedons.

Browtine Series

The Browtine series consists of very deep, well drained soils on hillslopes and fan terraces. They formed in outwash and alluvium. Slope ranges from 0 to 45 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Browtine soil, in an area of Browtine very gravelly fine sandy loam, 0 to 8 percent slopes, 800 feet south, 2,600 feet east of the northwest corner of sec. 34, T. 18 N., R. 77 W.

A—0 to 3 inches; brown (10YR 5/3) very gravelly fine sandy loam, brown (10YR 4/3) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; irregular interstitial pores; strongly effervescent, calcium carbonate is disseminated and the calcium carbonate equivalent is 7 percent; 45 percent gravel; the surface is 20 percent covered with fine gravel and a few cobbles; moderately alkaline; clear smooth boundary.

ABk—3 to 9 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common fine pores; violently effervescent, calcium carbonate is disseminated and also occurs as common thin pendants on rock fragments and as few fine pendant fragments, calcium carbonate equivalent is 18 percent; 55 percent gravel; moderately alkaline; clear smooth boundary.

Bk1—9 to 14 inches; white (10YR 8/2) very gravelly sandy loam, very pale brown (10YR 7/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine pores; violently effervescent, calcium carbonate is disseminated and the calcium carbonate equivalent is 37 percent; 45 percent gravel; moderately alkaline; gradual wavy boundary.

Bk2—14 to 31 inches; white (10YR 8/2) extremely gravelly loam, very pale brown (10YR 7/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine pores; violently effervescent, calcium carbonate is disseminated and the calcium carbonate equivalent is 36 percent; 75 percent gravel; strongly alkaline; clear wavy boundary.

C—31 to 60 inches; brownish yellow (10YR 6/6) extremely gravelly coarse sandy loam, yellowish brown (10YR 5/6) moist; massive; slightly hard, very friable, nonsticky and nonplastic; strongly effervescent, calcium carbonate is disseminated and few fine pendants of calcium carbonate are on rock fragments, few fine pendant fragments, calcium carbonate equivalent is 7 percent; 80 percent gravel; moderately alkaline.

The surface is 10 to 50 percent covered with gravel, cobbles, and a few stones. The particle-size control section averages 8 to 15 percent noncarbonate clay. It is 40 to 70 percent fine or coarser sand and 35 to 75 percent rock fragments. In some pedons a 2Bk or 2C horizon is present below the Bk horizon. The hue is 10YR or 2.5Y in the A, 2Bk, and 2C horizons and 7.5YR to 2.5Y in the Bk horizon. The A horizon has a slightly alkaline or moderately alkaline reaction. The reaction in the Bk and C horizons is moderately alkaline or strongly alkaline. Calcium carbonate equivalent is less than 10 percent in the A horizon and 15 to 40 percent in the Bk horizon.

Rock fragments in the A horizon consist of 10 to 50 percent gravel, 0 to 50 percent cobbles, and less than 5 percent stones. The Bk and C horizons have fine-earth textures of coarse sandy loam, sandy loam, or loam. They are very gravelly, extremely gravelly, very cobbly, or extremely cobbly. The rock fragments in the Bk and C horizons consist of 25 to 75 percent gravel and 0 to 50 percent cobbles. In some pedons the Bk horizon is not present above a depth of 60 inches. The texture of the 2Bk and 2C horizons is gravelly clay loam or extremely gravelly sandy clay loam.

Bruja Series

The Bruja series consists of moderately deep, well drained soils on canyon sides and escarpments. They formed in residuum and colluvium derived from interbedded sandstone and limestone. Slope ranges from 20 to 60 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Bruja very cobbly very fine sandy loam, in an area of Bruja-Canwall-Telecan association, 3 to 60 percent slopes, 1,900 feet west, 2,400 feet south of the northeast corner of sec. 12, T. 16 N., R. 73 W.

A—0 to 5 inches; yellowish brown (10YR 5/4) very cobbly very fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, very

friable, nonsticky and nonplastic; many very fine and fine roots; slightly effervescent, calcium carbonate is disseminated; 20 percent coarse gravel and 15 percent 3- to 5-inch diameter cobbles; the surface is 90 percent covered with gravel and cobbles; moderately alkaline; clear smooth boundary.

Bk1—5 to 15 inches; light yellowish brown (10YR 6/4) very cobbly very fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine, and fine roots; strongly effervescent, calcium carbonate is disseminated and also occurs as many thin coatings and pendants on the undersides of rock fragments; 30 percent gravel and 20 percent cobbles; moderately alkaline; gradual wavy boundary.

Bk2—15 to 23 inches; pale brown (10YR 6/3) extremely cobbly very fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; violently effervescent, calcium carbonate is disseminated and also occurs as many thick pendants on the undersides of rock fragments, 25 percent calcium carbonate equivalent; 25 percent coarse gravel and 40 percent cobbles; moderately alkaline; abrupt irregular boundary.

Cr—23 inches; fractured interbedded sandstone and limestone.

The surface is 70 to 90 percent covered with gravel and cobbles. The depth to bedrock ranges from 20 to 40 inches. The particle-size control section is 6 to 17 percent clay, 15 to 35 percent fine or coarser sand, and 50 to 65 percent rock fragments.

The A horizon is 15 to 25 percent gravel and 15 to 25 percent cobbles. It has a slightly alkaline or moderately alkaline reaction. The Bk horizon has a fine-earth texture of very fine sandy loam or fine sandy loam; it is very cobbly or extremely cobbly. Rock fragments in the Bk horizon consist of 20 to 30 percent gravel, 20 to 40 percent cobbles, and 0 to 10 percent flagstones. Calcium carbonate equivalent in the Bk horizon is 15 to 25 percent.

Bucklon Series

The Bucklon series consists of shallow, well drained soils on foothills, ridges, and escarpments. They formed in residuum and colluvium derived from sedimentary rock. Slope ranges from 15 to 60 percent. Elevation is 7,600 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Bucklon sandy loam, in an area of Buffork-Bucklon sandy loams, 15 to 60 percent slopes, 650 feet north, 1,750 feet west of the southeast corner of sec. 29, T. 17 N., R. 77 W.

A—0 to 6 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; 10 percent fine igneous gravel; the surface is 10 percent covered with gravel and a few cobbles; neutral; clear smooth boundary.

AC—6 to 12 inches; 60 percent light brownish gray (2.5Y 6/2) and 40 percent brownish yellow (10YR 6/6) loam, grayish brown (2.5Y 5/2) and yellowish brown (10YR 5/6) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; 30 percent soft shale chips; neutral; clear smooth boundary.

C—12 to 16 inches; light yellowish brown (2.5Y 6/4) loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; 30 percent soft shale chips; neutral; abrupt smooth boundary.

Cr—16 inches; weakly consolidated sandstone.

The depth to bedrock ranges from 10 to 20 inches. The mollic epipedon is 7 to 8 inches thick. The particle-size control section averages 18 to 25 percent clay and is 0 to 15 percent rock fragments.

Buffork Series

The Buffork series consists of moderately deep, well drained soils on foothills, ridges, and escarpments. They formed in colluvium and residuum derived from sedimentary rock. Slope ranges from 15 to 60 percent. Elevation is 7,600 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Buffork sandy loam, in an area of Buffork-Bucklon Variant sandy loams, 15 to 60 percent slopes, 1,900 feet south, 2,100 feet east of the northwest corner of sec. 34, T. 17 N., R. 77 W.

A—0 to 1 inch; dark grayish brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; 10 percent fine gravel; the surface is 5 percent covered with gravel and 5 percent covered with cobbles; neutral; abrupt smooth boundary.

AB—1 to 7 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots; 5 percent fine gravel; neutral; clear smooth boundary.

Bt1—7 to 11 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; weak medium angular

blocky structure; soft, friable, nonsticky and nonplastic; common fine roots; many faint clay films on faces of peds; 5 percent fine gravel; neutral; clear smooth boundary.

Bt2—11 to 17 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate fine prismatic and angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; many faint clay films on faces of peds; 5 percent fine gravel and few soft shale chips; neutral; clear smooth boundary.

2C—17 to 26 inches; light yellowish brown (10YR 6/4) coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, nonsticky and nonplastic; 10 percent fine gravel; 35 percent fine soft shale chips; neutral.

2Cr—26 to 60 inches; weakly consolidated, coarse-grained sandstone and fine-grained conglomerate.

The surface is 10 to 15 percent covered with gravel and cobbles. The depth to bedrock ranges from 20 to 40 inches. The mollic epipedon is 7 to 8 inches thick. The 2C horizon is 5 to 10 percent clay and 10 to 15 percent rock fragments.

Bullock Series

The Bullock series consists of moderately deep, well drained soils on hillslopes and terrace escarpments. They formed in residuum and local alluvium derived dominantly from shale interbedded with sandstone. Slope ranges from 5 to 25 percent. Elevation is 6,000 to 7,000 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Bullock sandy loam, in an area of Abston-Bullock complex, 5 to 25 percent slopes, 1,300 feet east, 1,900 feet south of the northwest corner of sec. 25, T. 19 N., R. 76 W.

A—0 to 2 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; strong very fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and few medium roots; common very fine discontinuous irregular vesicular pores; the surface is 25 percent covered with gravel; slightly alkaline; abrupt smooth boundary.

Btn—2 to 8 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong coarse prismatic structure parting to strong fine and medium subangular blocky; very hard, very firm, sticky and plastic; many fine and few medium roots; common very fine constricted irregular pores; many prominent clay films on faces of peds; strongly alkaline; clear wavy boundary.

Btnk—8 to 16 inches; yellowish brown (10YR 5/4) clay loam, dark brown (10YR 4/3) moist; strong coarse prismatic structure parting to strong medium and coarse subangular blocky; very hard, very firm, sticky and plastic; many fine and few medium roots; common very fine constricted irregular pores; many prominent clay films on faces of peds; violently effervescent, calcium carbonate is disseminated and also occurs as many medium and large soft masses and coatings on peds; very strongly alkaline; clear wavy boundary.

Bkn—16 to 24 inches; light gray (10YR 7/2) loam, light brownish gray (10YR 6/2) moist; strong coarse prismatic structure; hard, firm, slightly sticky and slightly plastic; many fine and few medium roots; few very fine constricted irregular pores; violently effervescent, calcium carbonate is disseminated and also occurs as many fine soft masses and streaks; very strongly alkaline; gradual wavy boundary.

Cr—24 to 60 inches; weakly consolidated sandstone interbedded with weakly consolidated sodic shale.

The depth to bedrock ranges from 20 to 40 inches. Reaction is neutral or slightly alkaline in the A horizon, and strongly alkaline or very strongly alkaline in the Bt and Bk horizons. The Bt horizon has a texture of loam, sandy clay loam, or clay loam. The Bk horizon has a texture of loam or sandy clay loam.

Byrnie Series

The Byrnie series consists of shallow, well drained soils on hillslopes and escarpments. They formed in residuum and colluvium derived from limestone, sandstone, and shale. Slope ranges from 10 to 70 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Byrnie sandy loam, in an area of Rock Outcrop-Bruja-Byrnie complex, 30 to 70 percent slopes, 1,000 feet east, 1,900 feet south of the northeast corner of sec. 6, T. 14 N., R. 72 W.

A—0 to 2 inches; strong brown (7.5YR 5/6) gravelly fine sandy loam, strong brown (7.5YR 4/6) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; strongly effervescent, calcium carbonate is disseminated; 15 percent fine gravel; moderately alkaline; clear smooth boundary.

Bk1—2 to 9 inches; strong brown (7.5YR 4/6) gravelly fine sandy loam, brown (7.5YR 4/4) moist; single grain; loose, slightly sticky and slightly plastic; many

fine and few medium and coarse roots; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses; 30 percent gravel; moderately alkaline; clear wavy boundary.

Bk2—9 to 12 inches; light brown (7.5YR 6/4) gravelly fine sandy loam, strong brown (7.5YR 5/6) moist; single grain; loose, slightly sticky and nonplastic; few medium and coarse roots; violently effervescent, calcium carbonate is disseminated; 30 percent gravel; moderately alkaline; abrupt wavy boundary.

Cr—12 inches; weakly consolidated, interbedded sandstone, limestone, and shale.

The surface is 20 to 30 percent covered with gravel, cobbles, and flagstones. The depth to bedrock ranges from 10 to 20 inches. The particle-size control section is 9 to 15 percent clay and 20 to 35 percent rock fragments. The hue is 5YR or 7.5YR throughout the profile. The A horizon has a texture of sandy loam or gravelly fine sandy loam; it is 10 to 20 percent gravel. The Bk horizon has a texture of gravelly sandy loam or gravelly fine sandy loam.

Canburn Series

The Canburn series consists of very deep, poorly drained soils on flood plains and stream terraces. They formed in alluvium. Slope ranges from 1 to 4 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Canburn soil, in an area of Canburn loam, 1 to 4 percent slopes, 1,500 feet south, 2,500 feet east of the northwest corner of sec. 22, T. 13 N., R. 73 W.

A1—0 to 6 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; few fine distinct strong brown (7.5YR 5/8) mottles; strong medium granular structure; slightly hard, friable, slightly sticky and plastic; many very fine, fine, and medium roots; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; abrupt wavy boundary.

A2—6 to 12 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 3/2) moist; few fine distinct strong brown (7.5YR 5/8) mottles; moderate medium granular structure; slightly hard, very friable, sticky and slightly plastic; common fine and medium roots; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; abrupt irregular boundary.

A3—12 to 23 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/2) moist; common medium distinct strong brown (7.5YR 5/8) mottles; massive; slightly hard, very friable, sticky and slightly plastic; few medium roots; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; gradual wavy boundary.

AC—23 to 50 inches; brown (10YR 5/3) loam, dark brown (7.5YR 3/2) moist; common medium distinct strong brown (7.5YR 5/8) and dark gray (5YR 4/1) mottles; massive; very hard, friable, slightly sticky and slightly plastic; few medium roots to 30 inches; slightly effervescent, calcium carbonate is disseminated; 10 percent gravel; moderately alkaline; gradual wavy boundary.

2C—50 to 60 inches; light brown (7.5YR 6/4) coarse sandy loam, brown (7.5YR 5/4) moist; many medium and large distinct gray (5YR 6/1) bands of mottles; massive; very hard, friable, nonsticky and nonplastic; slightly effervescent, calcium carbonate is disseminated; 10 percent gravel; moderately alkaline.

The depth to a seasonal high water table ranges from 0.5 to 2 feet from April through July. The particle-size control section is 18 to 27 percent clay, 15 to 35 percent fine or coarser sand, and 0 to 10 percent rock fragments. The hue is 7.5YR or 10YR throughout the profile. Reaction is is slightly alkaline or moderately alkaline throughout the profile. The C horizon has a dominant texture of loam, but a few thin layers of coarse sandy loam occur in some pedons. The C horizon is 0 to 10 percent gravel.

Cantle Series

The Cantle series consists of very deep, somewhat poorly drained soils on flood plains and stream terraces. They formed in alluvium. Slope ranges from 0 to 3 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Cantle soil, in an area of Cantle loam, 0 to 3 percent slopes, 2,200 feet north, 500 feet west of the southeast corner of sec. 3, T. 15 N., R. 73 W.

A—0 to 5 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; strong medium granular structure; slightly hard, firm, slightly sticky and slightly plastic; many very fine, fine, and medium roots; slightly effervescent, calcium carbonate is disseminated; few fine seams of soluble salts, electrical conductivity of 2.6 millimhos per centimeter; moderately alkaline; clear smooth boundary.

AC—5 to 27 inches; brown (7.5YR 4/3) loam, dark brown (7.5YR 3/2) moist; common fine distinct strong brown (7.5YR 5/8) mottles; strong medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; violently

effervescent, calcium carbonate is disseminated; common fine seams of soluble salts, electrical conductivity of 4.5 millimhos per centimeter; moderately alkaline; clear smooth boundary.

Cg1—27 to 49 inches; brown (7.5YR 5/4) silty clay loam, dark brown (7.5YR 3/4) moist; common fine distinct strong brown (7.5YR 5/8) and gray (5Y 5/1) mottles; massive; hard, firm, sticky and plastic; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; gradual wavy boundary.

Cg2—49 to 60 inches; reddish brown (5YR 5/4) silty clay loam, dark reddish brown (5YR 3/4) moist; common fine distinct seams of gray (5Y 5/1) mottles; massive; extremely hard, very firm, very sticky and plastic; strongly effervescent, calcium carbonate is disseminated; moderately alkaline.

The depth to a seasonal high water table ranges from 0.5 to 2 feet from May through July. The hue is 10YR or 7.5YR in the A horizon and 5YR or 7.5YR in the C horizon. Reaction is moderately alkaline or strongly alkaline throughout the profile. Electrical conductivity ranges from 2 to 8 millimhos per centimeter in the A horizon, and from 4 to 8 millimhos per centimeter in the C horizon. The A horizon is 0 to 5 percent gravel. The C horizon has a texture of loam or silty clay loam.

Canwall Series

The Canwall series consists of moderately deep, well drained soils on cuesta dip slopes and canyon sides. They formed in eolian deposits and colluvium derived from limestone and sandstone overlying residuum derived from limestone. Slope ranges from 3 to 30 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Canwall fine sandy loam, in an area of Pilotpeak-Canwall complex, 3 to 20 percent slopes, 300 feet south, 800 feet west of the northeast corner of sec. 18, T. 15 N., R. 72 W.

A—0 to 3 inches; yellowish brown (10YR 5/4) fine sandy loam, dark brown (10YR 3/3) moist; weak fine and medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine, fine, and medium roots; slightly effervescent, calcium carbonate is disseminated; 5 percent coarse gravel and cobbles; moderately alkaline; abrupt smooth boundary.

Bt—3 to 12 inches; brown (7.5YR 5/4) very fine sandy loam, dark brown (7.5YR 3/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; many faint and distinct clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated; 5 percent coarse gravel and 5 percent angular cobbles; moderately alkaline; clear smooth boundary.

2Btk—12 to 16 inches; brown (7.5YR 5/4) very cobbly very fine sandy loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few medium roots; many faint clay films on faces of peds; strongly effervescent, calcium carbonate as common fine concretions and moderately thick pendants on the undersides of rock fragments; 15 percent coarse gravel and 25 percent angular cobbles; moderately alkaline; clear wavy boundary.

2Bk—16 to 24 inches; very pale brown (10YR 7/4) very cobbly very fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; violently effervescent, calcium carbonate is disseminated and also occurs as common fine concretions, thin seams, and thick pendants on the undersides of rock fragments, calcium carbonate equivalent is 18 percent; 15 percent coarse gravel and 45 percent angular cobbles; moderately alkaline; abrupt irregular boundary.

R—24 inches; hard limestone.

The surface is 0 to 25 percent covered with gravel and cobbles. The depth to bedrock ranges from 20 to 40 inches. The hue is 7.5YR or 10YR throughout the profile. Reaction is slightly alkaline or moderately alkaline in the A and Bt horizons. The A horizon is 5 to 20 percent gravel and 0 to 5 percent cobbles. The Bt horizon is 5 to 25 percent gravel and 0 to 5 percent cobbles. The Bt horizon has a texture of very fine sandy loam, fine sandy loam, gravelly fine sandy loam, or gravelly very fine sandy loam.

The 2Bk horizon is 10 to 20 percent gravel, 30 to 45 percent cobbles, and 0 to 15 percent flagstones. It has a texture of very cobbly fine sandy loam or very cobbly very fine sandy loam. Calcium carbonate equivalent in the 2Bk horizon is 17 to 32 percent.

Carbol Series

The Carbol series consists of shallow, well drained soils on foothills and mountain slopes. They formed in residuum and colluvium derived from granite. Slope ranges from 5 to 50 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Carbol sandy loam, in an area of Kezar-Carbol-Rock outcrop, 5 to 25 percent slopes, 1,300 feet north, 600 feet east of the southwest corner of sec. 31, T. 17 N., R. 71 W.

A—0 to 4 inches; brown (10YR 4/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; 10 percent cobbles; the surface is 25 percent covered with gravel; neutral; abrupt smooth boundary.

Bt—4 to 13 inches; dark yellowish brown (10YR 4/4) cobbly sandy clay loam, dark brown (10YR 3/3) moist; strong coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; many faint clay films on faces of peds; 15 percent cobbles and 10 percent gravel; neutral; clear wavy boundary.

C—13 to 19 inches; yellowish brown (10YR 5/4) extremely cobbly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; 10 percent gravel, 40 percent cobbles, and 20 percent stones; neutral; abrupt irregular boundary.

R—19 inches; hard granite.

The depth to bedrock ranges from 10 to 20 inches. The A horizon is 0 to 10 percent gravel and 0 to 10 percent cobbles. The Bt horizon has a texture of sandy clay loam or cobbly sandy clay loam; it is 20 to 28 percent clay, 35 to 50 percent fine or coarser sand, and 0 to 25 percent rock fragments. Rock fragments in the Bt horizon consist of 0 to 10 percent gravel and 0 to 15 percent cobbles.

The C horizon has a texture of very cobbly sandy clay loam or extremely cobbly sandy clay loam; it is 45 to 70 percent rock fragments. Rock fragments in the C horizon consist of 15 to 25 percent gravel, 25 to 45 percent cobbles, and 0 to 20 percent cobbles. Reaction in this horizon is neutral or slightly alkaline.

Carmody Series

The Carmody series consists of moderately deep, well drained soils on hills, ridges, and escarpments. They formed in residuum and local alluvium derived from sandstone. Slope ranges from 6 to 45 percent. Elevation is 6,500 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Carmody fine sandy loam, in an area of Carmody-Ryan Park fine sandy loams, 6 to 15 percent slopes, 50 feet west, 1,100 feet north of the southeast corner of sec. 17, T. 20 N., R. 75 W.

A1—0 to 1 inch; brown (10YR 4/3) fine sandy loam, brown (10YR 4/3) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine roots; common very fine and few fine continuous irregular pores; moderately alkaline; abrupt smooth boundary.

A2—1 to 5 inches; dark yellowish brown (10YR 4/4) fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and few fine roots; common very fine and few fine continuous irregular pores; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

C—5 to 29 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; many very fine and few fine roots to 18 inches, few very fine and fine roots 18 to 29 inches; common very fine and few fine continuous irregular pores; strongly effervescent, calcium carbonate as discontinuous filaments and seams; moderately alkaline; gradual wavy boundary.

Cr—29 inches; weakly consolidated sandstone.

The surface is 0 to 30 percent covered with gravel and cobbles. The depth to bedrock ranges from 20 to 40 inches. The particle-size control section is 12 to 16 percent clay. The C horizon commonly has a texture of fine sandy loam, but in some pedons it is very fine sandy loam.

Cathedral Series

The Cathedral series consists of shallow, well drained soils on foothills and mountains. They formed in residuum and colluvium derived from granite. Slope ranges from 5 to 40 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 12 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Cathedral very stony coarse sandy loam, in an area of Rock outcrop-Cathedral complex, 20 to 40 percent slopes, 1,200 feet north, 3,000 feet west of the southeast corner of sec. 21, T. 12 N., R. 71 W.

A—0 to 2 inches; very dark grayish brown (10YR 4/2) very stony coarse sandy loam, very dark brown (10YR 2/2) moist; moderate medium and fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; 25 percent gravel and cobbles, 25 percent stones; the surface is 70 percent covered with rock fragments consisting of mostly stones and boulders and some gravel and cobbles; neutral; abrupt smooth boundary.

AC—2 to 13 inches; dark brown (7.5YR 4/4) very gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; single grain; loose, nonsticky and nonplastic; common fine and medium roots; 55 percent fine gravel; neutral; abrupt smooth boundary.

R—13 inches; hard granite.

The surface is 45 to 70 percent covered with gravel, cobbles, stones, and boulders. The depth to bedrock ranges from 10 to 20 inches. The particle-size control section is 5 to 18 percent clay and 35 to 80 percent rock fragments.

The A horizon is 20 to 35 percent gravel, 0 to 20 percent cobbles, and 0 to 25 percent stones. The AC and C horizons have hue of 7.5YR or 10YR. The AC and C horizons commonly have textures of very gravelly coarse sandy loam, but in some pedons they are very gravelly sandy loam or very cobbly sandy loam. The AC and C horizons are 30 to 60 percent fine gravel, 0 to 20 percent cobbles, and 0 to 5 percent stones.

Center Creek Series

The Center Creek series consists of very deep, somewhat poorly drained soils on low stream terraces. They formed in alluvium. Slope ranges from 0 to 3 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Center Creek soil, in an area of Center Creek loam, 0 to 3 percent slopes, 900 feet south, 325 feet east of the northwest corner of sec. 1, T. 13 N., R. 76 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many fine roots; common very fine pores; neutral; clear smooth boundary.

Bt1—3 to 14 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and slightly plastic; common fine roots; few very fine pores; common distinct clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—14 to 23 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and slightly plastic; common fine roots; few very fine discontinuous random pores; common faint clay films on faces of peds; strongly effervescent, calcium carbonate as common medium irregular soft masses; slightly alkaline; clear smooth boundary.

Bt3—23 to 30 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and slightly plastic; common fine roots; few very fine discontinuous random pores; few faint clay films on faces of peds; neutral; clear smooth boundary.

BC—30 to 37 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; neutral; abrupt smooth boundary.

2C—37 to 60 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; common fine distinct yellowish brown (10YR 5/6) mottles; single grain; loose, nonsticky and nonplastic; 40 percent gravel; neutral.

The depth to a seasonal high water table ranges from 2 to 4 feet from April through August. The mollic epipedon is 18 to 30 inches thick. The particle-size control section is 28 to 35 percent clay and 15 to 35 percent fine sand and coarser sand. The A horizon is 0 to 10 percent gravel. The A and Bt horizons have neutral or slightly alkaline reactions. The 2C horizon commonly has a texture of very gravelly sandy loam, but in some pedons it is very gravelly loamy sand. This horizon is 35 to 50 percent medium and fine granitic gravel.

Chalkhill Series

The Chalkhill series consists of shallow, well drained soils on cuesta dip slopes. They formed in alluvium overlying residuum derived dominantly from sandstone. Slope ranges from 1 to 15 percent. Elevation is 7,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Chalkhill sandy loam, in an area of Renvers-Chalkhill complex, 1 to 15 percent slopes, 1,600 feet south, 2,000 feet east of the northwest corner of sec. 36, T. 27 N., R. 77 W.

A—0 to 2 inches; light yellowish brown (10YR 6/4) sandy loam, brown (10YR 4/3) moist; weak thin platy structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; many very fine and fine and few medium roots; 10 percent channery fragments; the surface is 30 percent covered with

sandstone channery fragments; neutral; abrupt wavy boundary.

Bt1—2 to 11 inches; brown (7.5YR 5/4) sandy clay loam, dark brown 7.5YR 4/4) moist; moderate medium prismatic structure parting to strong medium subangular blocky; hard, firm, sticky and plastic; common very fine and fine and few medium roots; many faint clay films on faces of peds; 10 percent channery fragments; neutral; clear wavy boundary.

Bt2—11 to 14 inches; brown (7.5YR 5/4) extremely channery sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine, fine, and medium roots; many faint clay films on faces of peds and on channery fragments; 75 percent channery fragments; slightly alkaline; abrupt wavy boundary.

R—14 inches; hard sandstone.

The depth to bedrock is 10 to 20 inches. The particle-size control section is 20 to 35 percent clay and 35 to 50 percent fine or coarser sand. The content of rock fragments in the particle-size control section averages 5 to 30 percent. Hue throughout the profile is 10YR or 7.5YR. Reaction is neutral or slightly alkaline throughout the profile.

The Bt1 has a texture of sandy clay loam or clay loam; it is 5 to 15 percent channery fragments. The Bt2 horizon has a fine-earth texture of sandy clay loam or clay loam; it is 60 to 85 percent rock fragments. The rock fragments are dominantly channery fragments with a few flagstones. The Bt2 horizon is absent in some pedons.

Chalkville Series

The Chalkville series consist of very shallow or shallow and well drained soils on ridges and pediments. They formed in alluvium and residuum derived dominantly from tuff. Slope ranges from 0 to 15 percent. Elevation is 6,600 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Chalkville loam, in an area of Tule-Chalkville loams, 0 to 15 percent slopes, 2,550 feet south, 1,400 feet west of the northeast corner of sec. 15, T. 27 N., R. 77 W.

A—0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; 10 percent gravel; neutral; clear wavy boundary.

Bt1—2 to 7 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; weak coarse prismatic structure parting to moderate coarse subangular blocky; hard, firm, sticky and plastic; common very fine and few medium roots; common faint clay films on faces of peds; less than 5 percent angular gravel; neutral; clear wavy boundary.

Bt2—7 to 12 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, firm, sticky and plastic; common very fine and few medium roots; common faint clay films on faces of peds; 5 percent gravel; slightly alkaline; clear wavy boundary.

2C—12 to 15 inches; yellowish brown (10YR 5/4) extremely gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and slightly plastic; few very fine, fine, and medium roots; 80 percent gravel; moderately alkaline; abrupt wavy boundary.

R—15 inches; hard tuff.

The hue is 2.5Y or 10YR throughout the profile. The depth to bedrock ranges from 9 to 20 inches. The A and Bt horizons have neutral or slightly alkaline reactions. The Bt horizon has a texture of clay loam, sandy clay loam, or gravelly clay loam; it is 5 to 20 percent gravel. The 2C horizon has a fine-earth texture of sandy loam or sandy clay loam; it is 40 to 80 percent rock fragments. The rock fragments are dominantly gravel. Reaction in the 2C horizon is neutral to moderately alkaline.

Chaperton Series

The Chaperton series consists of moderately deep, well drained soils on ridges, escarpments, and hills. They formed in residuum and alluvium derived from sandstone, loamstone, and shale. Slope ranges from 3 to 30 percent. Elevation is 6,500 to 7,800 feet, average annual precipitation is 10 to 17 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Chaperton loam, in an area of Chaperton, moderately saline-Blazon complex, 8 to 20 percent slopes, 800 feet west, 50 feet south of the northeast corner of sec. 26, T. 21 N., R. 75 W.

A—0 to 4 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 4/3) moist; weak fine and medium granular structure; soft, friable, sticky and plastic; many fine and few medium roots; the surface is 20 percent covered with gravel and 5 percent covered with cobbles; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bw—4 to 16 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, sticky and plastic;

common fine and few medium roots; few distinct clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bk—16 to 20 inches; yellowish brown (10YR 5/4) loam, yellowish brown (10YR 5/4) moist; weak medium and coarse prismatic structure parting to weak fine and medium subangular blocky; hard, friable, sticky and plastic; common fine and few medium roots to 18 inches, few fine and medium roots below; strongly effervescent, calcium carbonate is disseminated and has a 10 percent calcium carbonate equivalent; moderately alkaline; gradual wavy boundary.

C—20 to 35 inches; yellowish brown (10YR 5/4) loam, light olive brown (2.5Y 5/4) moist; platy rock structure; hard, friable, sticky and plastic; few fine and medium roots to 30 inches; strongly effervescent, calcium carbonate is disseminated and has an 8 percent calcium carbonate equivalent; strongly alkaline; gradual wavy boundary.

Cr—35 inches; weakly consolidated shale.

The surface is 20 to 35 percent covered with gravel and cobbles. The The depth to the base of the cambic horizon ranges from 10 to 16 inches. The depth to bedrock ranges from 20 to 40 inches. The particle-size control section is 0 to 10 percent rock fragments. The A and Bw horizons commonly have a slightly alkaline reaction; but in areas of the saline phase, the reaction is moderately alkaline. The B and C horizons have hue of 10YR or 2.5Y. The Bk and C horizons have textures of loam or clay loam. Reaction is moderately alkaline or strongly alkaline in the Bk and C horizons.

Cheadle Series

The Cheadle series consists of shallow, well drained soils on ridges, canyon sides, cuestas, and escarpments. They formed in residuum and colluvium derived from sandstone and limestone. Slope ranges from 5 to 45 percent. Elevation is 7,600 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Cheadle fine sandy loam, in an area of Miracle-Cheadle association, 5 to 20 percent slopes, 300 feet north, 600 feet west of the southeast corner of sec. 34, T. 15 N., R. 72 W.

A—0 to 4 inches; brown (7.5YR 4/4) fine sandy loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine and medium roots; 14 percent cobbles; the surface is 35 percent covered with cobbles; neutral; abrupt smooth boundary.

Bw—4 to 9 inches; brown (7.5YR 4/4) channery fine sandy loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; 15 percent channery fragments; slightly alkaline; gradual wavy boundary.

C—9 to 16 inches; yellowish red (5YR 4/6) very channery fine sandy loam, dark reddish brown (5YR 3/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; slightly effervescent, calcium carbonate is disseminated; 20 percent gravel and 25 percent channery fragments; slightly alkaline; clear smooth boundary.

R—16 inches; hard sandstone.

The surface is 0 to 35 percent covered with channery fragments or flagstones. The depth to bedrock ranges from 10 to 20 inches. The mollic epipedon is 7 to 9 inches thick. The particle-size control section averages 7 to 18 percent clay and 35 to 60 percent rock fragments. The hue is 10YR or 7.5YR in the A and Bw horizons and 10YR to 5YR in the Bk and C horizons.

The Bw horizon has a texture of channery fine sandy loam or very cobbly very fine sandy loam. This horizon is absent in some pedons. The Bk and C horizons have dominant fine-earth textures of sandy loam, fine sandy loam, or very fine sandy loam. In some pedons however, a thin layer with a fine-earth texture of loamy fine sand is immediately above the bedrock. The Bk and C horizons are very channery or very cobbly. Reaction is slightly alkaline or moderately alkaline in the Bk and C horizons.

The Cheadle soil found in map units 142, 189, and 223 is outside the characteristics of the series. It does not have a horizon containing an accumulation of calcium carbonate.

Chugcreek Series

The Chugcreek series consists of moderately deep, well drained soils on foothills and mountain slopes. They formed in colluvium and alluvium derived dominantly from granite and gneiss. Slope ranges from 3 to 40 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Chugcreek sandy loam, in an area of Bonjea-Chugcreek-Rock outcrop, 3 to 15 percent slopes, 2,100 feet north, 200 feet east of the southwest corner of sec. 11, T. 18 N., R. 71 W.

A—0 to 4 inches; brown (10YR 4/3) sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very

fine and fine and common medium roots; 10 percent gravel; neutral; abrupt wavy boundary.

Bt1—4 to 19 inches; dark yellowish brown (10YR 3/4) sandy loam; very dark grayish brown (10YR 3/2) moist; moderate coarse prismatic structure parting to strong coarse subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; few faint clay films on faces of peds; 5 percent gravel; neutral; gradual wavy boundary.

Bt2—19 to 29 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark brown (10YR 3/3) moist; strong coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few medium roots; few distinct clay films on faces of peds; 10 percent gravel; slightly alkaline; gradual wavy boundary.

BC—29 to 38 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; 20 percent gravel; slightly alkaline; abrupt broken boundary.

R—38 inches; hard granite.

The depth to bedrock ranges from 20 to 40 inches. The A horizon is 0 to 10 percent gravel. The Bt horizon has a texture of sandy loam, sandy clay loam, or clay loam; it is 0 to 10 percent gravel and 18 to 35 percent clay. The Bt horizon has a texture of sandy loam, sandy clay loam, or clay loam. A C horizon is present in some pedons. The BC and C horizons have fine-earth textures of sandy clay loam or clay loam. They are is 0 to 20 percent gravel. Hue of the BC and C horizons is 10YR or 2.5Y. Reaction is neutral or slightly alkaline in the Bt, BC, and C horizons.

Cushool Series

The Cushool series consists of moderately deep, well drained soils on hills, ridges, and pediments. They formed in alluvium and residuum derived from sedimentary rocks. Slope ranges from 0 to 15 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Cushool fine sandy loam, in an area of Cushool-Diamondville fine sandy loams, 0 to 3 percent slopes, 2,300 feet east, 1,650 feet north of the southwest corner of sec. 4, T. 22 N., R. 73 W.

A—0 to 2 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few medium and fine roots; few fine and medium continuous irregular pores; neutral; abrupt smooth boundary.

BAt—2 to 4 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; weak fine subangular blocky and moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; few fine continuous irregular pores; few faint clay films on faces of peds; neutral; clear smooth boundary.

Bt—4 to 13 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate fine prismatic structure parting to moderate fine subangular blocky; very hard, firm, sticky and plastic; many distinct clay films on faces of peds and bridging sand grains; 10 percent medium and fine gravel; slightly alkaline; gradual smooth boundary.

Btk—13 to 16 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; strongly effervescent, calcium carbonate as common fine and medium soft masses and seams; 10 percent fine gravel; moderately alkaline; gradual smooth boundary.

Bk—16 to 32 inches; brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent, calcium carbonate coatings on faces of peds along vertical cracks; 10 percent gravel; moderately alkaline; gradual smooth boundary.

Cr—32 inches; weakly consolidated calcareous sandstone.

The The depth to horizons containing secondary calcium carbonate ranges from 11 to 16 inches. The depth to bedrock ranges from 20 to 40 inches. The A horizon is 0 to 10 percent gravel. It has a neutral or slightly alkaline reaction. The Bt horizon has hue of 7.5YR or 10YR; it is 22 to 30 percent clay, 35 to 55 percent fine or coarser sand, and 0 to 10 percent gravel. Reaction in the Bt horizon is neutral to moderately alkaline. The Bk horizon has a texture of sandy loam, fine sandy loam, or gravelly sandy loam. It has a moderately alkaline or strongly alkaline reaction.

Cutback Series

The Cutback series consists of moderately deep, well drained soils on pediments to the Laramie Range. They formed in alluvium and residuum derived from conglomerate and tuff. Slope ranges from 1 to 25 percent. Elevation is 6,800 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Cutback fine sandy loam, in an area of Cushool-Cutback complex, 2 to 10 percent slopes, 100

feet north, 1,200 feet west of the southeast corner of sec. 12, T. 24 N., R. 75 W.

A—0 to 1 inch; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine vesicular pores; 10 percent gravel; moderately alkaline; abrupt wavy boundary.

Bt—1 to 7 inches; yellowish brown (10YR 5/4) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; 5 percent gravel; slightly alkaline; clear wavy boundary.

Btk—7 to 17 inches; very pale brown (10YR 7/3) clay loam, pale brown (10YR 6/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; hard, friable, sticky and plastic; few faint pale brown (10YR 6/3) clay films on faces of peds; violently effervescent, calcium carbonate is disseminated; strongly alkaline; 10 percent gravel; clear wavy boundary.

2Bk1—17 to 25 inches; yellowish brown (10YR 5/4) extremely gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, sticky and plastic; violently effervescent, calcium carbonate as few medium and fine seams and soft masses; 80 percent gravel; moderately alkaline; clear wavy boundary.

2Bk2—25 to 31 inches; light olive brown (2.5Y 5/4) very gravelly sandy loam, olive brown (2.5Y 4/4) moist; massive; hard, friable, slightly sticky and slightly plastic; strongly effervescent, calcium carbonate as few medium and fine seams and soft masses; 50 percent gravel; strongly alkaline; abrupt wavy boundary.

3Cr—31 inches; weakly consolidated sandstone.

The The depth to the base of the argillic horizon and to the 2Bk horizon ranges from 10 to 17 inches. The depth to bedrock ranges from 20 to 40 inches. The A horizon has a neutral to moderately alkaline reaction. The Bt horizon has a slightly alkaline or moderately alkaline reaction. The Bt horizon has a texture of loam, sandy clay loam, or clay loam. The 2Bk horizon has a fine-earth texture of sandy clay loam, sandy loam, or loamy sand; it is 45 to 70 percent rock fragments. The 2Bk horizon has a moderately alkaline or strongly alkaline reaction. Calcium carbonate equivalent in the 2Bk horizon is 15 to 30 percent.

Dahlquist Series

The Dahlquist series consists of very deep, well drained soils on fan terraces. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,800 to 7,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Dahlquist very gravelly sandy loam, in an area of Dahlquist-Rawlins-Browtine complex, moist, 3 to 15 percent slopes, 300 feet east, 300 feet south of the northwest corner of sec. 33, T. 18 N, R. 77 W.

A—0 to 2 inches; light brownish gray (10YR 6/2) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and pores; 40 percent gravel and 10 percent cobbles; the surface is 20 percent covered with coarse gravel and fine cobbles; neutral; abrupt smooth boundary.

BA—2 to 5 inches; brown (10YR 5/3) very cobbly sandy clay loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots and pores; 25 percent gravel and 25 percent cobbles; neutral; clear smooth boundary.

Bt1—5 to 15 inches; yellowish brown (10YR 5/4) very cobbly sandy clay loam, brown (10YR 4/3) moist; moderate medium angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots and pores; many faint clay films on faces of peds; 30 percent gravel and 15 percent cobbles; slightly alkaline; clear smooth boundary.

Bt2—15 to 20 inches; brownish yellow (10YR 6/6) very gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few fine roots and pores; few faint clay films on faces of peds; 30 percent gravel and 10 percent cobbles; neutral; clear smooth boundary.

Bk2—20 to 60 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; strongly effervescent, calcium carbonate as few thin pendants on rock fragments; 45 percent gravel and 10 percent cobbles; moderately alkaline.

The surface is 15 to 50 percent covered with coarse gravel and fine cobbles. The Bt horizon has a texture of very cobbly sandy clay loam, very gravelly sandy clay loam, or extremely gravelly sandy clay loam; it is 20 to 28 percent clay, 35 to 50 percent fine or coarser sand, and 40 to 75 percent rock fragments. The Bt horizon has hue

of 7.5YR or 10YR. The reaction in this horizon is neutral or slightly alkaline. The Bk horizon has texture of very gravelly sandy loam or extremely gravelly sandy loam. It has a moderately alkaline or strongly alkaline reaction.

Dalecreek Series

The Dalecreek series consists of very deep, moderately well drained soils on flood plains and in valleys of mountainous areas. They formed in alluvium derived dominantly from granite. Slope ranges from 0 to 9 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Dalecreek sandy loam, in an area of Dalecreek-Kovich complex, 0 to 9 percent slopes, 1,200 feet west, 1,700 feet north of the southeast corner of sec. 36, T. 19 N., R. 73 W.

A—0 to 2 inches; dark grayish brown (10YR 4/2) sandy loam, very dark gray (10YR 3/1) moist; weak fine platy structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; neutral; abrupt smooth boundary.

AB—2 to 8 inches; dark grayish brown (10YR 4/2) sandy loam, very dark gray (10YR 3/1) moist; weak medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; many fine and few medium roots; slightly effervescent, calcium carbonate is disseminated; slightly alkaline; clear smooth boundary.

Bw1—8 to 21 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; slightly effervescent, calcium carbonate is disseminated; 5 percent fine gravel; slightly alkaline; gradual smooth boundary.

Bw2—21 to 32 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine roots; slightly alkaline; abrupt smooth boundary.

Cg—32 to 60 inches; gray (10YR 5/1) sandy clay loam stratified with thin lenses of loamy coarse sand, gray (10YR 5/1) moist; common medium distinct greenish gray (5GY 5/1), few fine faint olive (5Y 4/3), and few distinct very dark gray (5Y 3/1) mottles; massive; slightly hard, firm, slightly sticky and slightly plastic; few fine roots; slightly alkaline.

The depth to a seasonal high water table ranges from 2.5 to 4 feet from April through July. Reaction is neutral or moderately alkaline throughout the profile. The particle-size control section averages 18 to 35 percent clay. The Bw horizon has a texture of loam or sandy clay loam. The C horizon has a dominant texture of sandy clay loam or loam; but thin layers of loamy coarse sand, loamy sand, or sandy loam are present in most pedons.

Delphill Series

The Delphill series consists of moderately deep, well drained soils on hills, ridges, and escarpments. They formed in residuum and alluvium derived from shale and sandstone. Slope ranges from 3 to 45 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Delphill loam, in an area of Delphill-Blazon complex, 3 to 20 percent slopes, 2,000 feet east, 2,450 feet south of the northwest corner of sec. 19, T. 15 N., R. 75 W.

A—0 to 1 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate medium and fine platy structure; soft, friable, slightly sticky and slightly plastic; few fine roots; common very fine vesicular pores; violently effervescent, calcium carbonate is disseminated; 10 percent gravel; moderately alkaline; abrupt smooth boundary.

AC—1 to 6 inches; yellowish brown (10YR 5/4) clay loam, yellowish brown (10YR 5/4) moist; weak medium granular structure; soft, friable, slightly sticky and plastic; few fine roots; common very fine continuous irregular pores; violently effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

C—6 to 21 inches; very pale brown (10YR 7/4) clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, slightly sticky and plastic; few fine roots to 10 inches, few very fine roots below; common very fine continuous irregular pores; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Cr—21 inches; weakly consolidated shale interbedded with sandstone.

The surface is 0 to 10 percent covered with gravel and cobbles. The depth to bedrock ranges from 20 to 40 inches. The particle-size control section is 20 to 35 percent clay. The A horizon is 0 to 10 percent gravel. The C horizon has a texture of clay loam or loam.

Diamondville Series

The Diamondville series consists of moderately deep, well drained soils on hills and ridges. They formed in residuum and alluvium derived dominantly from sandstone and shale. Slope ranges from 0 to 15 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Diamondville fine sandy loam, in an area of Diamondville-Cushool complex, 3 to 15 percent slopes, 2,100 feet west, 2,500 feet north of the southeast corner of sec. 11, T. 16 N., R. 74 W.

A—0 to 3 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 4/3) moist; moderate medium and weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and common medium roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; abrupt smooth boundary.

AB—3 to 6 inches; pale brown (10YR 6/3) fine sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common fine and medium roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bt—6 to 18 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak coarse prismatic structure parting to strong medium subangular blocky; hard, firm, sticky and slightly plastic; common fine and medium roots; few faint clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bk1—18 to 22 inches; very pale brown (10YR 7/3) loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and slightly plastic; few fine and medium roots; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; gradual wavy boundary.

Bk2—22 to 35 inches; very pale brown (10YR 8/3) fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; hard, friable, slightly sticky and nonplastic; violently effervescent, calcium carbonate is disseminated; strongly alkaline; gradual wavy boundary.

Cr—35 to 60 inches; weakly consolidated interbedded sandstone and shale.

The depth to bedrock is 20 to 40 inches. Reaction is slightly alkaline or moderately alkaline in the A and Bt horizons. The A horizon is 0 to 5 percent gravel. The Bt horizon has a texture of loam or clay loam; it is 20 to 35 percent clay and 15 to 35 percent fine or coarser sand. The Bk horizon has a texture of loam or fine sandy loam. It has hue of 2.5Y or 10YR. Reaction in the Bk horizon is moderately alkaline or strongly alkaline.

Diamonkit Series

The Diamonkit series consists of moderately deep, well drained soils on hillslopes. They formed in residuum and alluvium derived dominantly from gypsiferous sandstone and shale. Slope ranges from 1 to 15 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Diamonkit sandy loam, in an area of Diamonkit-Stylite sandy loams, 3 to 15 percent slopes, 1,250 feet south, 725 feet east of the northwest corner of sec. 12, T. 18 N., R. 74 W.

A—0 to 1 inch; light yellowish brown (10YR 6/4) sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine roots; slightly alkaline; abrupt smooth boundary.

Bt—1 to 3 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak thin platy structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; few very fine pores; few faint clay films on faces of peds; moderately alkaline; clear smooth boundary.

Btk—3 to 11 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; strong medium and coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; common fine pores; many distinct clay films on faces of peds; violently effervescent, calcium carbonate is disseminated and also occurs as common medium threads and soft masses, 10 percent calcium carbonate equivalent; moderately alkaline; gradual smooth boundary.

Bky1—11 to 19 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine roots, common very fine pores; few faint clay films on faces of peds; violently effervescent, calcium carbonate is disseminated and also occurs as common medium threads and soft masses, 7 percent calcium carbonate equivalent; common soft masses of gypsum; electrical conductivity is 0.4 millimhos per

centimeter; moderately alkaline; gradual wavy boundary.

2Bky2—19 to 33 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, firm, sticky and plastic; few fine roots; few very fine pores; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine threads, 7 percent calcium carbonate equivalent; common medium threads and soft masses of gypsum; electrical conductivity is 4.6 millimhos per centimeter; moderately alkaline; gradual wavy boundary.

2Cr—33 to 60 inches; weakly consolidated interbedded sandstone and shale.

The The depth to horizons with an accumulation of gypsum ranges from 11 to 22 inches. The depth to bedrock ranges from 20 to 40 inches. The A horizon has a slightly alkaline or moderately alkaline reaction. The Bt horizon has a texture of loam or sandy clay loam. It has a moderately alkaline or strongly alkaline reaction. The Bky horizon has a texture of loam or clay loam. It has hue of 10YR or 2.5Y. The Bky horizon has a moderately alkaline or strongly alkaline reaction, and an electrical conductivity of less than 8 millimhos per centimeter; it is 5 to 15 percent gypsum.

Edlin Series

The Edlin series consists of very deep, well drained soils on foot slopes and back slopes of ridges and escarpments. They formed in alluvium derived from sandstone. Slope ranges from 15 to 45 percent. Elevation is 6,500 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Edlin fine sandy loam, in an area of Carmody-Edlin sandy loams, 15 to 45 percent slopes, 1,000 feet south, 15 feet west of the northeast corner of sec. 32, T. 16 N., R. 76 W.

A—0 to 3 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine roots; common very fine and few fine continuous irregular pores; neutral; abrupt smooth boundary.

BA—3 to 10 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots to 8 inches, few fine roots 8 to 10 inches; common very fine and few fine continuous irregular pores; neutral; clear smooth boundary.

Bw1—10 to 16 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine roots; common very fine and few fine continuous irregular pores; neutral; clear smooth boundary.

Bw2—16 to 23 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, light olive brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and slightly plastic; few fine roots; common very fine and few fine continuous irregular pores; slightly alkaline; clear smooth boundary.

Bk1—23 to 40 inches; pale yellow (2.5Y 7/4) fine sandy loam, light yellowish brown (2.5Y 6/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots to a depth of 36 inches; common very fine and few fine continuous irregular pores; strongly effervescent, calcium carbonate is disseminated and also occurs as a few thin (1 millimeter) pendants on gravel; 3 percent gravel; moderately alkaline; gradual smooth boundary.

Bk2—40 to 60 inches; light yellowish brown (10YR 6/4) sandy loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine continuous irregular pores; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses; less than 5 percent gravel; moderately alkaline.

The particle-size control section is 10 to 18 percent clay and 40 to 60 percent fine or coarser sand. The B horizons are 0 to 10 percent gravel. The Bw horizon has a neutral or slightly alkaline reaction. The Bk horizon has a texture of sandy loam or fine sandy loam. The calcium carbonate equivalent in the Bk horizon is 8 to 20 percent.

Elkol Series

The Elkol series consists of very deep, well drained soils on stream terraces and on hillslopes adjacent to playas. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Elkol silty clay loam, in an area of Elkol-Gerdrum Family complex, 1 to 8 percent slopes, 2,100 feet north, 600 feet west of the southeast corner of sec. 35, T. 15 N., R. 74 W.

A—0 to 2 inches; yellowish brown (10YR 5/4) silty clay loam, brown (10YR 4/3) moist; moderate medium granular structure; soft, very friable, sticky and plastic; many fine and medium roots; strongly alkaline; abrupt smooth boundary.

C1—2 to 9 inches; light olive brown (2.5Y 5/4) silty clay loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, firm, sticky and plastic; few fine and medium roots; strongly effervescent, calcium carbonate is disseminated; 10 percent soft shale platelets; strongly alkaline; gradual wavy boundary.

C2—9 to 18 inches; light olive brown (2.5Y 5/4) silty clay loam, olive brown (2.5Y 4/4) moist; massive; hard, firm, sticky and plastic; few fine and medium roots; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine seams and soft masses; 10 percent soft shale fragments; strongly alkaline; gradual wavy boundary.

C3—18 to 30 inches; yellowish brown (10YR 5/4) silty clay loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, friable, sticky and plastic; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine seams and soft masses; 10 percent soft shale fragments; strongly alkaline; clear wavy boundary.

2C4—30 to 60 inches; light yellowish brown (10YR 6/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; 5 percent fine gravel; moderately alkaline.

Electrical conductivity ranges from 2 to 8 millimhos per centimeter throughout the profile. Reaction is moderately alkaline or strongly alkaline throughout the profile. Hue throughout the profile is 10YR or 2.5Y. Some pedons have a Bky horizon. The Bky and C horizons have textures of clay loam, silty clay loam, silty clay, or clay. Some pedons have a 2C horizon below a depth of 30 inches; this horizon has a texture of sandy clay loam.

Evanston Series

The Evanston series consists of very deep, well drained soils on foothills, mountain slopes, alluvial fans, and fan terraces. They formed in eolian deposits and alluvium. Slope ranges from 0 to 30 percent. Elevation is 6,300 to 7,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Evanston soil, in an area of Evanston fine sandy loam, 0 to 6 percent slopes, 2,400 feet south, 2,600 feet east of the northwest corner of sec. 18, T. 18 N., R. 70 W.

A—0 to 4 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; medium fine granular structure; soft, very friable, nonsticky and nonplastic; few fine and very fine pores; 5 percent fine gravel; neutral; abrupt smooth boundary.

Bt1—4 to 8 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few very fine pores; many faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—8 to 14 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure parting to strong medium and fine angular blocky; very hard, firm, slightly sticky and plastic; few fine and very fine roots; few very fine pores; many faint clay films on faces of peds; slightly alkaline; clear wavy boundary.

Btk—14 to 20 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate coarse and medium angular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine pores; few very fine pores; common faint clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear wavy boundary.

Bk1—20 to 36 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; moderate medium and fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine pores to 30 inches; violently effervescent, calcium carbonate is disseminated and also occurs as soft masses; 10 percent fine gravel; moderately alkaline; clear wavy boundary.

Bk2—36 to 60 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; massive; hard, friable, slightly sticky and slightly plastic; violently effervescent, calcium carbonate is disseminated and also occurs as soft masses; 14 percent fine gravel; strongly alkaline.

The mollic epipedon is 7 to 10 inches thick. The Bt horizon has a texture of loam, sandy clay loam, or clay loam. The Bk horizon has a texture of loam or clay loam. The Bk horizon has a moderately alkaline or strongly alkaline reaction.

Fiveoh Series

The Fiveoh series consists of very deep, well drained soils on alluvial fans and terraces. They formed in alluvium. Slope ranges from 1 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Fiveoh sandy loam, in an area of Fiveoh-Fiveoh, cobbly substratum-Ryan Park complex, 1 to 8 percent slopes, 250 feet east, 200 feet north of the southwest corner of sec. 25, T. 16 N., R. 73 W.

A—0 to 2 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 3/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and common medium roots; slightly effervescent, calcium carbonate is disseminated; slightly alkaline; abrupt smooth boundary.

AB—2 to 6 inches; brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 3/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine, fine, and common medium roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bw—6 to 16 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; strong coarse prismatic structure parting to strong coarse subangular blocky; hard, friable, nonsticky and nonplastic; common very fine, fine, and medium roots; strongly effervescent, calcium carbonate is disseminated; 5 percent gravel 2 to 3 inches in diameter; moderately alkaline; clear wavy boundary.

Bk1—16 to 27 inches; light brown (7.5YR 6/4) fine sandy loam, dark brown (7.5YR 4/4) moist; strong coarse prismatic structure parting to strong coarse subangular blocky; hard, firm, slightly sticky and nonplastic; few medium and coarse roots; violently effervescent, calcium carbonate is disseminated and also occurs as pendants on rock fragments; 10 percent coarse gravel; moderately alkaline; gradual wavy boundary.

Bk2—27 to 37 inches; light brown (7.5YR 6/4) fine sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; violently effervescent, calcium carbonate is disseminated and also occurs as pendants on rock fragments; 10 percent coarse gravel; moderately alkaline; gradual wavy boundary.

Bk3—37 to 60 inches; strong brown (7.5YR 5/6) fine sandy loam, strong brown (7.5YR 4/6) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; strongly effervescent, calcium carbonate is disseminated; moderately alkaline.

The particle-size control section is 5 to 18 percent clay. The control section averages 0 to 25 percent rock fragments. The A horizon has hue of 10YR or 7.5YR. The Bw horizon has a texture of sandy loam or fine sandy loam and is 0 to 10 percent gravel.

In areas of the cobbly substratum phase, the Bk horizon has a texture of cobbly sandy loam, gravelly fine sandy loam, or fine sandy loam and is 0 to 20 percent cobbles and 10 to 15 percent gravel. In other areas, the Bk horizon has a texture of sandy loam or fine sandy loam and is 0 to 15 percent gravel. In areas of the cobbly substratum phase, a 2Bk horizon is present below a depth of 30 inches; this horizon has a texture of very cobbly sandy loam.

Calcium carbonate equivalent in the Bk horizon is 15 to 40 percent. Calcium carbonate equivalent in the 2Bk horizon is 10 to 20 percent. Reaction in the Bk and 2Bk horizons is moderately alkaline or strongly alkaline.

Folavar Series

The Folavar series consists of very deep, somewhat poorly drained soils on stream terraces. They formed in alluvium. Slope ranges from 0 to 3 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Folavar very gravelly sandy loam, in an area of Folavar-Borollic Camborthids complex, 0 to 3 percent slopes, 2,500 feet east, 50 feet north of the southwest corner of sec. 27, T. 14 N., R. 76 W.

Oi—2 inches to 0; dense mat of roots and decaying organic materials.

A—0 to 5 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; many very fine and few fine continuous irregular pores; 40 percent gravel; neutral; clear smooth boundary.

Bw—5 to 12 inches; dark yellowish brown (10YR 4/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; many medium distinct strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; many very fine and few fine continuous irregular pores; 30 percent gravel; neutral; gradual smooth boundary.

2C1—12 to 20 inches; yellowish brown (10YR 5/4) very gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few fine roots; many very fine and common fine continuous irregular pores; 60 percent gravel; neutral; gradual wavy boundary.

2C2—20 to 60 inches; yellowish brown (10YR 5/4) extremely gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few fine roots; many very fine and common fine continuous irregular pores; 70 percent gravel; slightly alkaline.

The surface is 0 to 25 percent covered with gravel. The The depth to the base of the cambic horizon is 11 to 12 inches. The depth to a seasonal high water table ranges from 0 to 2 feet from April through August. The rock

fragments throughout the profile are dominantly gravel with a few cobbles.

The A horizon is 35 to 45 percent rock fragments. The Bw horizon has a texture of gravelly sandy loam or very gravelly sandy loam; this horizon is 30 to 40 percent rock fragments. The C horizon commonly has a texture of very gravelly loamy sand or extremely gravelly loamy sand, but in some pedons it is extremely gravelly sand. The C horizon is 55 to 70 percent rock fragments. Reaction in the Bw and C horizons is neutral or slightly alkaline.

Forelle Series

The Forelle series consists of very deep, well drained soils on terraces, hills, and fan aprons. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Forelle fine sandy loam, in an area of Forelle-Diamondville association, 3 to 15 percent slopes, 800 feet east, 50 feet south of the northwest corner of sec. 1, T. 15 N., R. 74 W.

A—0 to 4 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; strong fine granular structure; soft, very friable, nonsticky and nonplastic; 5 percent gravel; slightly alkaline; clear smooth boundary.

Bt1—4 to 7 inches; brown (10YR 5/3) loam, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, very friable, slightly sticky and slightly plastic; few distinct clay films on faces of peds; 5 percent gravel; slightly alkaline; clear smooth boundary.

Bt2—7 to 15 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; very hard, friable, slightly sticky and slightly plastic; many faint clay films on faces of peds and filling pores; 5 percent gravel; slightly alkaline; clear wavy boundary.

Btk—15 to 20 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak medium subangular blocky; very hard, friable, slightly sticky and slightly plastic; few faint clay films on faces of peds and along root channels; strongly effervescent, calcium carbonate is disseminated and also occurs as soft masses and seams; 5 percent gravel; moderately alkaline; gradual smooth boundary.

Bk—20 to 60 inches; light yellowish brown (2.5Y 6/3) loam, light olive brown (2.5Y 5/3) moist; massive; hard, friable, slightly sticky and slightly plastic; strongly effervescent, calcium carbonate is disseminated and also occurs as soft masses, calcium carbonate decreases with increasing depth; 10 percent gravel; moderately alkaline.

The A and Bt horizons are 0 to 5 percent gravel. The Bt horizon commonly has a texture of clay loam, but in some pedons it is loam. The Bk horizon has a texture of sandy loam, fine sandy loam, sandy clay loam, or loam. It has hue of 2.5Y through 10YR. The Bk horizon is 0 to 10 percent gravel; it has a moderately alkaline or strongly alkaline reaction.

Gerdrum Family

The Gerdrum family consists of very deep, well drained or moderately well drained soils on hillslopes, fan terraces, and stream terraces. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Gerdrum Family loam, in an area of Tisworth-Gerdrum Family loams, 1 to 8 percent slopes, 850 feet east, 700 feet south of the northwest corner of sec. 21, T. 19 N., R. 73 W.

E—0 to 1 inch; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak fine platy structure parting to weak fine granular; soft, friable, slightly sticky and slightly plastic; common fine and few medium roots; many very fine and few fine continuous irregular pores; slightly alkaline; abrupt smooth boundary.

Btn1—1 to 4 inches; yellowish brown (10YR 4/4) clay loam, dark brown (10YR 4/3) moist; strong medium prismatic structure parting to strong medium angular blocky; hard, firm, sticky and plastic; common fine and few medium roots; common very fine and few fine continuous irregular pores; many distinct clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated; strongly alkaline; clear smooth boundary.

Btn2—4 to 16 inches; yellowish brown (10YR 5/4) clay loam, yellowish brown (10YR 5/4) moist; strong medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; common fine and few medium roots; common very fine and few fine continuous irregular pores; common distinct clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated; strongly alkaline; clear smooth boundary.

Bkyz1—16 to 36 inches; yellowish brown (10YR 5/4) clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to weak medium subangular blocky; slightly hard, firm, sticky and plastic; few fine roots; common very fine and few fine

continuous irregular pores; strongly effervescent, calcium carbonate is disseminated and also occurs as many large seams and soft masses; common (10 percent) medium soft masses of gypsum and other more soluble salts; moderately alkaline; clear smooth boundary.

Bkyz2—36 to 60 inches; brown (10YR 5/3) clay, dark yellowish brown (10YR 4/4) moist; many fine and medium distinct gray (10YR 5/1) lithochromic mottles; massive; hard, firm, sticky and plastic; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses; common (5 percent) fine and medium soft masses of gypsum and other more soluble salts; moderately alkaline.

The E horizon has a neutral to moderately alkaline reaction. The Btn horizon has a texture of clay loam, silty clay loam, silty clay, or clay; it is 35 to 45 percent clay. The Btn horizon has hue of 10YR or 2.5Y. It has a strongly alkaline or very strongly alkaline reaction.

The Bkyz horizon has a texture of clay loam, silty clay loam, or clay. It has hue of 10YR or 2.5Y. This horizon is 1 to 5 percent gypsum. It has a moderately alkaline to very strongly alkaline reaction, and an electrical conductivity of more than 8 millimhos per centimeter.

In map unit 155, this soil has a seasonal high water table at a depth of 4 to 6 feet.

Gerrard Series

The Gerrard series consists of very deep, poorly drained soils on low terraces and flood plains. They formed in alluvium. Slope ranges from 0 to 2 percent. Elevation is 6,000 to 7,500 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Gerrard loam, in an area of Grenoble-Gerrard complex, 0 to 3 percent slopes, 2,150 feet south, 2,100 feet east of the northwest corner of sec. 29, T. 14 N., R. 75 W.

A1—0 to 6 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; neutral; clear smooth boundary.

A2—6 to 12 inches; grayish brown (10YR 5/2) loam, very dark gray (10YR 3/1) moist; common fine distinct strong brown (7.5YR 5/6 and 5/8) moist mottles; weak fine granular structure and some horizontal bedding planes; hard, friable, slightly sticky and slightly plastic; few fine roots; neutral; clear smooth boundary.

2C—12 to 24 inches; light brownish gray (2.5Y 6/2) very gravelly loamy sand, very dark grayish brown (2.5Y 3/2) moist; single grain; loose, nonsticky and nonplastic; 60 percent gravel; neutral; gradual smooth boundary.

2Cg—24 to 60 inches; light gray (10YR 7/2) very gravelly sand, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; 60 percent gravel; slightly alkaline.

The depth to the 2C horizon ranges from 12 to 18 inches. Reaction is neutral or slightly alkaline throughout the profile. The depth to a seasonal high water table ranges from 0 to 1.5 feet from March through June. The A horizon has hue of 10YR through 5Y; it is 0 to 10 percent gravel. The 2C horizon has hue of 10YR or 2.5Y. It has a fine-earth texture of loamy sand, loamy fine sand, or sand. The 2C horizon commonly is 35 to 60 percent gravel, but in some pedons it is less than 35 percent gravel or as much as 75 percent gravel.

Glendive Series

The Glendive series consists of very deep, moderately well drained soils on flood plains and low terraces. They formed in alluvium. Slope ranges from 0 to 3 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Glendive loam, in an area of Glendive-Redrob-Grenoble, 0 to 3 percent slopes, 1,800 feet east, 2,850 feet north of the southwest corner of sec. 34, T. 21 N., R. 74 W.

A1—0 to 2 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; moderately alkaline; abrupt smooth boundary.

A2—2 to 6 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many fine and few medium roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

AC—6 to 12 inches; yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; 50 percent weak medium subangular blocky structure and 50 percent horizontal bedding planes; slightly hard, friable, nonsticky and nonplastic; few fine and medium roots; slightly alkaline; gradual smooth boundary.

C1—12 to 30 inches; brown (10YR 5/3) fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very

friable, nonsticky and nonplastic; few fine and medium roots; slightly alkaline; abrupt smooth boundary.
C2—30 to 36 inches; dark grayish brown (2.5Y 4/2) sandy loam, very dark grayish brown (2.5Y 3/2) moist; massive; slightly hard, friable, nonsticky and nonplastic; slightly alkaline; abrupt smooth boundary.
C3—36 to 60 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; few fine distinct brownish yellow (10YR 6/6) moist, mottles; massive; slightly hard, very friable, nonsticky and nonplastic; slightly alkaline.

Reaction is slightly alkaline or moderately alkaline throughout the profile. The particle-size control section averages 10 to 18 percent clay. The depth to a seasonal high water table ranges from 3 to 5 feet in April through August. The C horizon has a dominant texture of sandy loam or fine sandy loam, but thin layers of loam or loamy sand are commonly present.

Granile Series

The Granile series consists of very deep, well drained soils on fan terrace escarpments, foothills, and mountain alluvial fans. They formed in alluvium derived from igneous and metamorphic rock. Slope ranges from 6 to 45 percent. Elevation is 7,600 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Granile gravelly sandy loam, in an area of Ansel-Granile gravelly sandy loams, 6 to 45 percent slopes, 1,000 feet north, 500 feet west of the southeast corner of sec. 13, T. 14 N., R. 78 W.

Oe—1 inch to 0; partially decomposed pine needles.
A—0 to 2 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium platy structure; slightly hard, very friable, nonsticky and nonplastic; common medium and fine roots; 20 percent fine gravel, 5 percent cobbles; neutral; clear smooth boundary.
E—2 to 10 inches; light gray (10YR 7/2) very gravelly sandy loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few medium and fine roots; 45 percent gravel and 10 percent cobbles; neutral; clear smooth boundary.
EB—10 to 15 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few medium and fine roots, 40 percent gravel, 10 percent cobbles; neutral; clear wavy boundary.
Bt—15 to 24 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; weak medium prismatic structure parting to moderate medium angular blocky; hard, friable, slightly sticky and slightly plastic; few medium and fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds; 40 percent gravel, 10 percent cobbles; neutral; gradual smooth boundary.
C—24 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; 40 percent gravel; neutral.

The surface is covered with 0 to 15 percent gravel and 0 to 5 percent cobbles. The E horizon has hue of 10YR or 7.5YR. This horizon is 10 to 50 percent rock fragments. The Bt horizon has a texture of very gravelly sandy clay loam, very gravelly clay loam, or very cobbly clay loam. It is 25 to 35 percent clay, 30 to 50 percent fine or coarser sand, and 40 to 60 percent rock fragments. Hue of the Bt horizon is 10YR or 7.5YR. The C horizon has a texture of very gravelly sandy loam or very cobbly sandy loam.

Grenoble Series

The Grenoble series consists of very deep, somewhat poorly drained soils on flood plains and low stream terraces. They formed in alluvium. Slope ranges from 0 to 3 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Grenoble gravelly loamy sand, in an area of Grenoble-Gerrard complex, 0 to 3 percent slopes, 200 feet west, 150 feet south of the northeast corner of sec. 25, T. 14 N., R. 76 W.

A—0 to 9 inches; brown (10YR 4/3) gravelly loamy sand, dark brown (7.5YR 3/2) moist; moderate medium granular structure; slightly hard, friable, nonsticky and nonplastic; few fine and medium roots; about 20 percent medium and fine igneous gravel; slightly acid; clear smooth boundary.
C—9 to 60 inches; yellowish brown (10YR 5/4) very gravelly sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; about 55 percent gravel and 5 percent igneous cobble; slightly acid.

The surface is 0 to 40 percent covered with igneous gravel. Reaction is slightly acid to slightly alkaline throughout the profile. The depth to a seasonal high water table ranges from 2 to 3.5 feet from March through

August. The C horizon has a texture of very gravelly loamy sand or very gravelly sand.

Greyback Series

The Greyback series consists of very deep, somewhat excessively drained soils on outwash alluvial fans. They formed in glacial outwash derived from various sources. Slope ranges from 1 to 6 percent. Elevation is 7,800 to 8,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Greyback very cobbly sandy loam, in an area of Greyback very cobbly sandy loam, 1 to 6 percent slopes, 250 feet east, 50 feet south of the northwest corner of sec. 12, T. 15 N., R. 78 W.

A—0 to 3 inches; grayish brown (10YR 5/2) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; common very fine continuous pores; 10 percent gravel, 30 percent cobbles; the surface is covered with 20 percent cobbles and 10 percent stones; slightly alkaline; abrupt smooth boundary.

AB—3 to 9 inches; brown (10YR 5/3) very cobbly sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots; few very fine continuous pores; 10 percent gravel, 40 percent cobbles, and 10 percent stones; neutral; clear wavy boundary.

Bw—9 to 16 inches; pale brown (10YR 6/3) very cobbly sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots to 10 inches, few very fine below; 20 percent gravel, 25 percent cobbles, and 10 percent stones; slightly alkaline; clear wavy boundary.

Bk1—16 to 30 inches; brown (10YR 5/3) very cobbly coarse sandy loam, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; strongly effervescent; common thin (1-3 mm) pendants of calcium carbonate on rock fragments; 20 percent gravel and 40 percent cobbles; moderately alkaline; clear wavy boundary.

Bk2—30 to 36 inches; brown (10YR 5/3) very gravelly loamy coarse sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; strongly effervescent; many thin (1-3 mm) pendants of calcium carbonate on rock fragments; 40 percent gravel and 10 percent cobbles; moderately alkaline; clear wavy boundary.

Bk3—36 to 60 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; strongly effervescent; few thin (1-3 mm) pendants of calcium carbonate on rock fragments; 40 percent gravel and 5 percent cobbles; moderately alkaline.

The surface is 20 to 30 percent covered with gravel, cobbles, and stones. The mollic epipedon is 7 to 9 inches thick. The A horizon is 10 to 20 percent gravel and 20 to 30 percent cobbles. It has a neutral or slightly alkaline reaction. The Bw horizon has a texture of very cobbly sandy loam or very gravelly sandy loam. This horizon is 20 to 40 percent gravel, 20 to 25 percent cobbles, and 0 to 10 percent stones. The Bw horizon has a neutral or slightly alkaline reaction.

The Bk horizon has a dominant fine-earth texture of coarse sandy loam, but thin layers of loamy coarse sand or loamy sand occur in some pedons. This horizon is very gravelly, extremely gravelly, or very cobbly. It is 20 to 45 percent gravel, 5 to 40 percent cobbles, and 0 to 5 percent stones.

Gypla Series

The Gypla series consists of very deep, somewhat poorly drained soils on flood plains and in swales and sloughs. They formed in alluvium. Slope ranges from 0 to 3 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Gypla soil, in an area of Gypla loam, 0 to 3 percent slopes, 1,175 feet west and 2,340 feet north of the southeast corner of sec. 34, T. 14 N., R. 73 W.

A—0 to 5 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; slightly effervescent; electrical conductivity of 21 millimhos per centimeter; 5 percent gravel; moderately alkaline; clear smooth boundary.

By1—5 to 36 inches; white (10YR 8/2) silt loam, very pale brown (10YR 8/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; slightly effervescent; calcium carbonate is disseminated and also occurs as few small masses; many fine irregular small masses of gypsum; electrical conductivity of 14 millimhos per centimeter; 5 percent gravel; slightly alkaline; gradual wavy boundary.

By2—36 to 60 inches; very pale brown (10YR 7/3) gravelly silt loai, brownish yellow (10YR 6/6) moist with few fine distinct light olive brown (2.5Y 5/8) and many fine and medium distinct very pale brown (10YR 8/3) mottles; massive; soft, very friable, slightly sticky

and slightly plastic; slightly effervescent; calcium carbonate is disseminated and also occurs as fine small masses; many fine irregular small masses of gypsum; electrical conductivity of 18 millimhos per centimeter; 16 percent gravel; slightly alkaline.

The depth to a seasonal high water table ranges from 1.5 to 3.5 feet from April through July. The hue is 7.5YR through 10YR throughout the profile. Electrical conductivity is greater than 12 millimhos per centimeter throughout the profile. Reaction throughout the profile is slightly alkaline or moderately alkaline.

The By horizon has a fine-earth texture of loam or silt loam with 10 to 18 percent clay. The part of the By horizon above a depth of 35 inches is 0 to 5 percent gravel. The part of the By horizon below a depth of 35 inches is 10 to 20 percent gravel. Calcium carbonate equivalent in the By horizon ranges from 1 to 14 percent. This horizon is 40 to 60 percent gypsum.

Hanson Series

The Hanson series consists of very deep, well drained soils on fan terraces. They formed in glacial outwash or glacial outwash overlying glacial till. Slope ranges from 3 to 15 percent. Elevation is 7,800 to 8,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Hanson gravelly sandy loam, in an area of Hanson-Quander complex, 3 to 15 percent slopes, 2,000 feet north, 350 feet west of the southeast corner of sec. 8, T. 17 N., R. 77 W.

A—0 to 3 inches; brown (10YR 4/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common medium and fine roots; common fine pores; few fine soft masses of calcium carbonate, strongly effervescent; 25 percent medium and coarse gravel and few cobbles; the surface is covered with 20 percent gravel, 5 percent cobbles, and a few stones; slightly alkaline; clear smooth boundary.

ABk—3 to 8 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few fine and very fine roots; common very fine pores; common fine soft masses of calcium carbonate, violently effervescent, calcium carbonate equivalent is 27 percent; 20 percent medium and coarse gravel, 10 percent cobbles; slightly alkaline; clear wavy boundary.

Bk1—8 to 12 inches; pinkish white (7.5YR 8/2) very cobbly loam, pinkish gray (7.5YR 7/2) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic, few fine and very fine roots; common very fine pores; calcium carbonate is disseminated and also occurs as pendants on under sides of rock fragments, violently effervescent, calcium carbonate equivalent is 42 percent; 15 percent medium and coarse gravel, 30 percent cobbles, and 5 percent stones; moderately alkaline; clear wavy boundary.

Bk2—12 to 25 inches; pink (7.5YR 8/4) very cobbly loam, pink (7.5YR 7/4) moist; massive, slightly hard, friable, slightly sticky and slightly plastic; few very fine pores; calcium carbonate is disseminated and also occurs as pendants on undersides and sides of rock fragments, violently effervescent, calcium carbonate equivalent is 41 percent; 20 percent medium and coarse gravel, 35 percent cobbles, and 5 percent stones; strongly alkaline; clear smooth boundary.

2Bk3—25 to 60 inches; reddish yellow (7.5YR 6/6) very cobbly clay loam, strong brown (7.5YR 5/6) moist; massive; hard, friable, sticky and plastic; common fine and very fine pores; common fine carbonate filaments and thin pendants on rock fragments; slightly effervescent, calcium carbonate equivalent is 2 percent; 30 percent medium and coarse gravel, 30 percent fine cobbles, and a few stones in upper part; moderately alkaline.

The surface is 25 to 45 percent covered with gravel, cobbles, and a few stones. The mollic epipedon is 8 to 12 inches thick. The particle-size control section averages 20 to 30 percent clay, 35 to 50 percent fine or coarser sand, and 45 to 60 percent rock fragments.

The A horizon is 15 to 25 percent gravel and 10 percent cobbles. It has a slightly alkaline or moderately alkaline reaction. The Bk horizon commonly has a texture of very cobbly loam or very cobbly clay loam, but in some pedons it is very gravelly loam. It has hue of 7.5YR or 10YR. The Bk horizon is 15 to 45 percent gravel, 10 to 40 percent cobbles, and 0 to 10 percent stones. It has a moderately alkaline or strongly alkaline reaction. Calcium carbonate equivalent in the Bk horizon is 40 to 50 percent. The 2Bk horizon is absent in some pedons.

This Hanson soil is outside the characteristics of the Hanson series. The mollic epipedon of this soil has a higher color value and chroma and it is thinner.

Hapjack Series

The Hapjack series consists of shallow, well drained soils on foothills and mountain slopes. They formed in residuum and colluvium derived from granite. Slope ranges from 5 to 25 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Hapjack gravelly sandy loam, in an area of Hapjack-Rogert-Amesmont complex, 3 to 25 percent slopes, 1,800 feet east, 40 feet north of the southwest corner of sec. 24, T. 14 N., R. 72 W.

A—0 to 3 inches; brown (7.5YR 5/2) gravelly sandy loam, dark brown (7.5YR 3/2) moist; moderate medium and fine granular structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine and few medium roots; 20 percent gravel; the surface is 40 percent covered with gravel; neutral; abrupt smooth boundary.

Bt—3 to 10 inches; brown (7.5YR 5/4) gravelly sandy clay loam, dark brown (7.5YR 4/4) moist; strong coarse and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; many faint clay films on faces of peds; 33 percent gravel; neutral; clear smooth boundary.

C—10 to 19 inches; brown (7.5YR 5/4) extremely gravelly sandy loam, brown (7.5YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; 62 percent gravel; neutral; abrupt irregular boundary.

R—19 inches; granite.

The depth to bedrock ranges from 10 to 20 inches. The control section, which includes the Bt and C horizons, averages 15 to 24 percent clay and 35 to 60 percent rock fragments. Reaction is neutral or slightly alkaline throughout the profile. The hue is 7.5YR or 10YR in the A horizon, 5YR to 10YR in the Bt horizon, and 5YR or 7.5YR in the C horizon.

The A horizon is 15 to 35 percent gravel. The Bt horizon has a texture of gravelly sandy clay loam, gravelly sandy loam, very gravelly sandy loam, or very gravelly sandy clay loam. The C horizon has a texture of extremely gravelly sandy loam, extremely gravelly loamy sand, or very gravelly sandy loam. This horizon is 40 to 80 percent gravel.

Hilltoppe Series

The Hilltoppe series consists of shallow, well drained soils on fan terraces. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 7,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Hilltoppe very gravelly sandy loam, in an area of Browtine-Hilltoppe very gravelly sandy loams, 0 to 8 percent slopes, 2,080 feet north, 25 feet east of the southwest corner of sec. 33, T. 16 N., R. 76 W.

A—0 to 3 inches; brown (10YR 5/3) very gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots and pores; strongly effervescent, calcium carbonate disseminated and as pendant fragments, calcium carbonate equivalent is 15 percent; 40 percent medium and fine quartzite gravel; the surface is 30 percent covered with gravel; moderately alkaline; clear smooth boundary.

Bk1—3 to 8 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; very weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots and pores; violently effervescent, calcium carbonate disseminated and also as many pendants on rock fragments and pendant fragments, calcium carbonate equivalent is 42 percent; 50 percent medium quartzite gravel; moderately alkaline; clear smooth boundary.

Bk2—8 to 14 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, pale brown (10YR 6/3) moist; massive; soft, very friable, nonsticky and slightly plastic; few fine roots and pores; violently effervescent, calcium carbonate disseminated and also occurs as and many pendants on rock fragments and pendant fragments, calcium carbonate equivalent is 51 percent; 75 percent medium and coarse quartzite gravel and few cobbles; moderately alkaline; abrupt smooth boundary.

Bkm—14 to 33 inches; petrocalcic horizon consisting of 40 percent quartzite gravel and 30 percent quartzite cobbles in an indurated, laminated calcium carbonate matrix; abrupt smooth boundary.

Ck—33 to 60 inches; pale brown (10YR 6/3) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; strongly effervescent, calcium carbonate disseminated, calcium carbonate equivalent is 25 percent; 50 percent quartzite gravel and 20 percent fine quartzite cobbles; moderately alkaline.

The surface is 0 to 30 percent covered with gravel and a few cobbles. The The depth to the petrocalcic horizon ranges from 10 to 20 inches. The particle-size control section is 8 to 18 percent clay and 35 to 85 percent rock fragments. The hue is 7.5YR through 2.5Y throughout the profile.

The A horizon has a slightly alkaline or moderately alkaline reaction. The Bk horizon has a fine-earth texture of sandy loam or fine sandy loam and it is very gravelly or extremely gravelly. This horizon is 50 to 80 percent rock fragments. The rock fragments consist of 50 to 75 percent gravel and 0 to 20 percent cobbles. The Bk horizon has a moderately alkaline or strongly alkaline reaction. Calcium carbonate equivalent in this horizon is 40 to 60 percent.

The Bkm horizon is 15 to 40 percent gravel and 30 to 45 percent cobbles. The Ck horizon has a calcium

carbonate equivalent of 10 to 30 percent and a moderately alkaline or strongly alkaline reaction.

Ipson Series

The Ipson series consists of very deep, well drained soils on dissected alluvial fans and fan terraces. They formed in gravelly alluvium. Slope ranges from 6 to 30 percent. Elevation is 6,500 to 7,200 feet, average annual precipitation is 15 to 17 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Ipson gravelly sandy loam, in an area of Ipson-Evanston complex, 6 to 30 percent slopes, 2,600 feet east, 1,650 feet south of the northwest corner of sec. 18, T. 18 N., R. 70 W.

A—0 to 2 inches; grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine and very fine roots; 15 percent fine gravel; neutral; clear smooth boundary.

AB—2 to 8 inches; brown (10YR 4/3) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few fine and very fine roots; few fine pores; 20 percent fine gravel; slightly alkaline; clear smooth boundary.

Bt—8 to 14 inches; brown (10YR 5/3) very gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; few fine pores; many distinct clay films on faces of peds; 40 percent fine gravel; slightly alkaline; gradual smooth boundary.

C1—14 to 24 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 50 percent medium and fine gravel; slightly alkaline; gradual smooth boundary.

C2—24 to 60 inches; very pale brown (10YR 7/3) very gravelly coarse sandy loam, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; 50 percent medium and fine gravel; slightly alkaline.

The mollic epipedon is 8 to 10 inches thick. The A horizon has a neutral or slightly alkaline reaction. The Bt horizon is 20 to 30 percent clay and 35 to 50 percent fine or coarser sand.

This soil is outside the characteristics of the Ipson series because it is noneffervescent in the C horizons.

Joemre Series

The Joemre series consists of very deep, well drained soils on alluvial fans, fan aprons, and terraces. They formed in alluvium. Slope ranges from 2 to 15 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Joemre soil, in an area of Joemre fine sandy loam, 3 to 6 percent slopes, 2,000 feet west, 2,700 feet north of the southeast corner of sec. 14, T. 16 N., R. 73 W.

A—0 to 2 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; strongly effervescent, calcium carbonate is disseminated; less than 5 percent gravel; slightly alkaline; abrupt smooth boundary.

Bt—2 to 5 inches; yellowish red (5YR 5/6) fine sandy loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and few medium roots to 4 inches, few fine and medium roots below; few faint clay films lining pores and bridging sand grains; strongly effervescent, calcium carbonate is disseminated and has a 7 percent calcium carbonate equivalent; less than 5 percent gravel; moderately alkaline; clear wavy boundary.

Btk—5 to 13 inches; yellowish red (5YR 4/6) loam, red (2.5YR 4/6) moist; strong coarse prismatic structure parting to strong coarse subangular blocky; hard, firm, slightly sticky and slightly plastic; few fine and medium roots; common distinct clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses, 9 percent calcium carbonate equivalent; less than 5 percent gravel; moderately alkaline; clear wavy boundary.

Bk—13 to 60 inches; yellowish red (5YR 5/8) fine sandy loam, yellowish red (5YR 5/6) moist; massive; slightly hard, friable, sticky and nonplastic; few fine and medium roots; violently effervescent, calcium carbonate is disseminated and also occurs as thin pendants on the undersides of gravel, 13 percent calcium carbonate equivalent; 10 percent gravel; moderately alkaline.

The hue is 2.5YR to 7.5YR in the A horizon and 5YR or 2.5YR in the Bt horizon. The A horizon has a slightly alkaline or moderately alkaline reaction. The Bt and Bk

horizons have textures of fine sandy loam, very fine sandy loam, or loam. The Bt horizon is 10 to 17 percent clay and 0 to 5 percent rock fragments. The Bk horizon is 0 to 10 percent gravel. Calcium carbonate equivalent in the Bk horizon is 9 to 20 percent. The Bk horizon has a moderately alkaline or strongly alkaline reaction.

Kemmerer Series

The Kemmerer series consists of moderately deep, well drained soils on escarpments. They formed in residuum and alluvium derived from shale. Slope ranges from 3 to 20 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Kemmerer clay loam, in an area of Moyerson-Kemmerer complex, 3 to 20 percent slopes, 2,150 feet south, 100 feet west of the northeast corner of sec. 26, T. 25 N., R. 76 W.

A—0 to 2 inches; light brownish gray (2.5Y 6/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium granular structure; slightly hard, friable, sticky and plastic; few fine roots; neutral; abrupt smooth boundary.

Bw1—2 to 8 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine roots; 20 percent soft shale platelets that break down when wetted; slightly alkaline; clear smooth boundary.

Bw2—8 to 15 inches; grayish brown (2.5Y 5/2) clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium angular blocky structure; very hard, very firm, sticky and plastic; few fine roots; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; gradual smooth boundary.

Bk1—15 to 25 inches; gray (5Y 5/1) silty clay loam, dark gray (5Y 4/1) moist; many fine distinct dark grayish brown (2.5Y 4/2), moist, lithochromic mottles; massive; hard, firm, sticky and plastic; few fine roots; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine filaments or threads; moderately alkaline; gradual smooth boundary.

Bk2—25 to 34 inches; olive gray (5Y 5/2) silty clay, olive gray (5Y 4/2) moist; massive; hard, firm, sticky and plastic; few fine roots; slightly effervescent, calcium carbonate as few fine filaments or threads; 75 percent soft shale platelets that break down when moistened and rubbed; moderately alkaline; gradual smooth boundary.

Cr—34 to 60 inches; weakly consolidated shale bedrock with few fine salt accumulations in fractures.

The depth to bedrock ranges from 20 to 40 inches. The A horizon has a neutral or slightly alkaline reaction. The Bw horizon has a slightly alkaline or moderately alkaline reaction. The B horizons have textures of clay loam, silty clay loam, or silty clay.

Kezar Series

The Kezar series consists of moderately deep, well drained soils on foothills and mountain slopes. They formed in residuum and colluvium derived from granite. Slope ranges from 5 to 25 percent. Elevation is 7,800 to 9,000 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Kezar sandy loam, in an area of Kezar-Carbol-Rock outcrop complex, 5 to 25 percent slopes, 1,270 feet north, 570 feet east of the southwest corner of sec. 31, T. 17 N., R. 71 W.

A—0 to 4 inches; brown (10YR 4/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine, fine, and common medium roots; neutral; abrupt wavy boundary.

AB—4 to 10 inches; dark yellowish brown (10YR 4/4) sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure parting to moderate medium granular; soft, very friable, nonsticky and nonplastic; common very fine and few medium roots; very few faint clay films on faces of peds; neutral; abrupt wavy boundary.

Bt1—10 to 20 inches; brown (7.5YR 4/4) sandy clay loam, dark brown (7.5YR 3/4) moist; weak; coarse prismatic structure parting to moderate fine subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; few thin and distinct clay films on faces of peds; 5 percent gravel and 5 percent cobbles; neutral; clear wavy boundary.

2Bt2—20 to 31 inches; light olive brown (2.5Y 5/4) very cobbly sandy clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few fine and medium roots; few faint clay films on faces of peds; 25 percent cobbles and 20 percent gravel; neutral; clear wavy boundary.

R—31 inches; anorthositic granite.

The depth to hard bedrock ranges from 20 to 40 inches. The mollic epipedon is 7 to 11 inches thick. The particle-size control section averages 5 to 15 percent rock fragments. The Bt1 horizon has hue of 10YR or 7.5YR. This horizon is 0 to 15 percent gravel and 0 to 5 percent cobbles. The 2Bt2 horizon is absent in some pedons.

Kildor Series

The Kildor series consists of moderately deep, well drained soils on mountain slopes and mountain toe slopes. They formed in residuum and alluvium derived from shale. Slope ranges from 5 to 50 percent. Elevation is 7,800 to 8,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Kildor gravelly loam, in an area of Kildor-Rock outcrop association, 5 to 50 percent slopes, 3,300 feet north, 2,400 feet east of the southwest corner of sec. 12, T. 16 N., R. 78 W.

A—0 to 10 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine pores; 15 percent gravel and 5 percent cobbles; the surface is 30 percent covered with gravel and cobbles; neutral; abrupt wavy boundary.

Bw1—10 to 15 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; neutral; abrupt wavy boundary.

Bw2—15 to 22 inches; light olive brown (2.5Y 5/4) clay loam, olive brown (2.5Y 4/4) moist; moderate medium and fine angular blocky structure; hard, firm, sticky and plastic; few fine roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; abrupt wavy boundary.

Bk—22 to 38 inches; light gray (2.5Y 7/2) clay, light brownish gray (2.5Y 6/2) moist; moderate massive; very hard, firm, sticky and plastic; violently effervescent, calcium carbonate is disseminated and also occurs as many medium soft masses; moderately alkaline; abrupt wavy boundary.

Cr—38 inches; light gray (10YR 7/1) weakly consolidated brittle shale.

The surface is 0 to 30 percent covered with igneous gravel and small cobbles. The depth to bedrock ranges from 20 to 40 inches. The mollic epipedon is 10 to 12 inches thick. The particle-size control section is 35 to 45 percent clay and 15 to 35 percent fine or coarser sand. The A horizon is 10 to 20 percent gravel and 0 to 5 percent cobbles. The Bw and Bk horizons have textures of clay loam or clay. The Bw horizon has a neutral to moderately alkaline reaction. The Bk horizon has hue of 10YR or 2.5Y.

Kiltabar Series

The Kiltabar series consists of very deep, somewhat poorly drained soils on stream terraces, in drainageways, and in areas adjacent to playas and intermittent lakes. They formed in alluvium. Slope ranges from 0 to 3 percent, with hummocky microrelief common. Elevation is 6,800 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Kiltabar silty clay loam, in an area of Kiltabar-Tismid complex, 0 to 3 percent slopes, 550 feet east, 250 feet south of the northwest corner of sec. 29, T. 19 N., R. 74 W.

Azy—0 to 1 inch; yellowish brown (10YR 5/4) silty clay loam; dark yellowish brown (10YR 4/4) moist; strong very thick platy structure; hard, very friable, very sticky and very plastic; common very fine continuous irregular pores; slightly effervescent, calcium carbonate is disseminated; common (5 percent) soft masses of gypsum; electrical conductivity of 30 millimhos per centimeter; strongly alkaline; abrupt smooth boundary.

Bzy1—1 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam, dark yellowish brown (10YR 4/4) moist; massive; extremely hard, friable, very sticky and very plastic; common very fine continuous irregular pores; strongly effervescent, calcium carbonate is disseminated; common (5 percent) fine crystals of gypsum and other salts; electrical conductivity of 29 millimhos per centimeter; moderately alkaline; clear smooth boundary.

Bzy2—16 to 40 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; massive; extremely hard, friable, very sticky and very plastic; common very fine continuous irregular pores; slightly effervescent, calcium carbonate is disseminated; many (25 percent) medium and coarse crystals of gypsum and other salts; electrical conductivity of 28 millimhos per centimeter; moderately alkaline; gradual wavy boundary.

C—40 to 60 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; massive; extremely hard, friable, very sticky and very plastic; common very fine continuous irregular pores; slightly effervescent, calcium carbonate is disseminated; electrical conductivity of 8 millimhos per centimeter; strongly alkaline.

The depth to a seasonal high water table ranges from 2 to 4 feet from March through September. The hue is 10YR or 2.5Y throughout the profile. Reaction is

moderately alkaline or strongly alkaline throughout the profile. The Bzy horizon has a texture of silty clay loam, clay loam, or loam. The C horizon has a texture of clay loam or silty clay loam. Electrical conductivity in the C horizon is more than 8 millimhos per centimeter.

Kovich Series

The Kovich series consists of very deep, poorly drained soils on flood plains and in valleys of mountainous areas. They formed in alluvium derived dominantly from granite. Slope ranges from 0 to 3 percent slopes. Elevation is 6,000 to 7,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Kovich loam, in an area of Dalecreek-Kovich complex, 0 to 9 percent slopes, 850 feet south and 2,400 feet east of the northwest corner of sec. 9, T. 18 N., R. 71 W.

A—0 to 8 inches; dark brown (10YR 3/3) loam, very dark brown (10YR 2/2) moist; common fine prominent strong brown (7.5YR 5/8) mottles; strong coarse granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine and common medium roots; 5 percent gravel; neutral; clear smooth boundary.

A2—8 to 31 inches; black (10YR 2/1) loam, very dark grayish brown (10YR 3/2) moist; many medium prominent strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common fine and few medium roots; 5 percent gravel; slightly alkaline; gradual wavy boundary.

Cg—31 to 60 inches; grayish brown (10YR 5/2) gravelly sandy clay loam stratified with sandy loam, loam, and gravelly sand, very dark gray (10YR 3/1) moist; many medium prominent strong brown (7.5YR 5/8) and many large prominent gray (5Y 5/1) mottles; massive; very hard, firm, slightly sticky and slightly plastic; few fine roots; 15 percent gravel; mildly alkaline.

The depth to a seasonal high water table ranges from 0 to 2.5 feet from April through August. The mollic epipedon is 28 to 41 inches thick. The particle-size control section averages 18 to 30 percent clay and 5 to 20 percent gravel. Reaction is neutral or slightly alkaline throughout the profile. The A2 horizon has a fine-earth texture of loam, sandy clay loam, or clay loam; it is 5 to 20 percent gravel. The C horizon has hue of 10YR, 5Y, or 5GY. It has a dominant texture of gravelly sandy clay loam, but is stratified with layers of loam, sandy loam, loamy sand, or gravelly sand. The C horizon averages 15 to 30 percent gravel.

Lahtida Series

The Lahtida series consists of moderately deep, well drained soils on the back slopes and foot slopes of the interfluve ridges and on breaks of the dissected pediments to the Laramie Range. They formed in alluvium and residuum derived dominantly from tuffaceous claystone. Slope ranges from 2 to 12 percent. Elevation is 7,000 to 7,500 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Lahtida loam, in an area of Shirley Basin-Twocabin-Lahtida complex, 0 to 15 percent slopes, 1,500 feet south and 500 feet east of the northwest corner of sec. 4, T. 27 N., R. 76 W.

A—0 to 2 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine and common medium roots; the surface is 25 percent covered with gravel and cobbles; neutral; clear wavy boundary.

Bt1—2 to 10 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure parting to strong medium subangular blocky; slightly hard, firm, sticky and plastic; common very fine and fine and few medium roots; slightly alkaline; clear wavy boundary.

Bt2—10 to 15 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, sticky and plastic; few very fine, fine, and medium roots; many distinct clay films on faces of peds; moderately alkaline; clear wavy boundary.

Bk—15 to 28 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; strongly effervescent, calcium carbonate as common distinct threads; strongly alkaline; abrupt wavy boundary.

Cr—28 inches; slightly effervescent weakly consolidated claystone.

The hue is 10YR or 7.5YR throughout the profile. The depth to bedrock ranges from 20 to 40 inches. The A horizon has a neutral or slightly alkaline reaction. The Bt horizon is 35 to 50 percent clay. It has a texture of clay

loam or clay. Reaction in the Bt horizon is slightly alkaline or moderately alkaline. The Bk horizon has a texture of loam, sandy clay loam, or clay loam. It has a moderately alkaline or strongly alkaline reaction.

Lakehelen Series

The Lakehelen series consists of moderately deep, well drained soils on foothills and mountain slopes. They formed in residuum and colluvium derived from granite. Slope ranges from 5 to 50 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Lakehelen fine sandy loam, in an area of Lakehelen-Redfeather-Amesmont complex, 5 to 20 percent slopes, 1,300 feet east, 500 feet north of the southwest corner of sec. 7, T. 16 N., R. 71 W.

Oi—2 inches to 1; undecomposed needles, twigs, and bark; abrupt smooth boundary.

Oe—1 inch to 0; decomposed needles, twigs, and bark; abrupt smooth boundary.

E—0 to 14 inches; light yellowish brown (10YR 6/4) fine sandy loam, brown (7.5YR 4/4) moist; moderate fine platy structure parting to weak very fine platy; soft, very friable, nonsticky and nonplastic; common medium and coarse roots; 5 percent fine gravel; neutral; clear smooth boundary.

E/B—14 to 17 inches; light brown (7.5YR 6/4) sandy loam, brown (7.5YR 4/4) moist; weak and moderate very fine platy structure; soft, very friable, nonsticky and nonplastic; few coarse roots; interfingered with brown (7.5YR 5/4) gravelly sandy loam, dark brown (7.5YR 3/4) moist; moderate coarse subangular blocky structura; slightly hard, very friable, slightly sticky and slightly plastic; few coarse roots; 15 percent gravel; neutral; gradual irregular boundary.

Bt—17 to 26 inches; strong brown (7.5YR 5/6) very gravelly sandy clay loam, yellowish red (5YR 4/6) moist; strong coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse roots; many distinct and few prominent clay films on faces of peds; 40 percent gravel; neutral; abrupt wavy boundary.

C—26 to 38 inches; reddish brown (5YR 5/4) extremely gravelly sandy loam, reddish brown (5YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; 65 percent gravel; neutral; abrupt wavy boundary.

R—38 inches; hard granite.

The surface is covered with a layer of forest litter 1 to 3 inches thick. The depth to bedrock ranges from 20 to 40 inches. The E horizon is 0 to 10 percent gravel. The Bt and C horizons have neutral or slightly alkaline reactions. The Bt horizon is 20 to 30 percent clay, 35 to 55 percent fine or coarser sand, and 35 to 45 percent rock fragments. The C horizon is absent in some pedons.

Leavitt Series

The Leavitt series consists of very deep, well drained soils on fan terraces and hills. They formed in alluvium. Slope ranges from 1 to 45 percent. Elevapion is 7,600 to 8,900 feet, average annual precipitation is 10 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Leavitt sandy loam, in an area of Thiel-Lymanson-Leavitt complex, 5 to 20 percent slopes, 2,550 feet west, 2,175 feet north of the southeast corner of sec. 12, T. 12 N., R. 77 W.

A—0 to 5 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; many fine roots; the surface is 20 percent covered with gravel; neutral; clear smooth boundary.

AB—5 to 14 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium and coarse prismatic structure parting to weak coarse angular blocky; soft, very friable, slightly sticky and slightly plastic; many fine roots to 6 inches, common fine roots below; neutral; clear smooth boundary.

Bt—14 to 22 inches; light brown (7.5YR 6/4) clay loam, brown (7.5YR 5/4) moist; moderate coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; many distinct clay films on faces of peds; 5 percent gravel; slightly alkaline; gradual smooth boundary.

Btk—22 to 36 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; slightly effervescent, few fine threads of calcium carbonate; 5 percent gravel; moderately alkaline; diffuse smooth boundary.

Bk—36 to 60 inches; very pale brown (10YR 7/4) sandy clay loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses; 5 percent gravel; moderately alkaline.

The mollic epipedon is 10 to 14 inches thick. The hue is 7.5YR or 10YR throughout the profile. The Bt horizon has a texture of sandy clay loam or clay loam. It has neutral or slightly alkaline reaction. The Bk horizon has a

texture of loam, sandy clay loam, or clay loam; it is 0 to 5 percent gravel.

The Leavitt soil found in map units 180 and 181 is outside the characteristics of the Leavitt series. In map unit 180, the Bt horizon is gravelly loam and the Bk horizon is very gravelly coarse sandy loam. In map unit 181, the Bt horizon is gravelly clay loam, the Btk horizon is very gravelly clay loam, and the 2Bk horizon is clay.

Lininger Series

The Lininger series consists of moderately deep, well drained soils on foothills and mountain slopes. They formed in residuum and alluvium derived from granite. Slope ranges from 1 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Lininger loam, in an area of Boyle-Lininger association, 1 to 15 percent slopes, 600 feet north, 700 feet east of the southwest corner of sec. 25, T. 13 N., R. 72 W.

A—0 to 4 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, and common medium roots; the surface is 30 percent covered with gravel; neutral; abrupt smooth boundary.

AB—4 to 7 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; slightly alkaline; clear smooth boundary.

Bt1—7 to 14 inches; brown (7.5YR 4/4) gravelly sandy clay loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure parting to moderate medium granular; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; few faint clay films on faces of peds; 25 percent gravel; slightly alkaline; clear smooth boundary.

Bt2—14 to 22 inches; strong brown (7.5YR 4/6) very gravelly sandy clay loam, yellowish red (5YR 4/6) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few medium roots; many thin and few distinct clay films on faces of peds; 40 percent gravel; slightly alkaline; gradual smooth boundary.

BC—22 to 24 inches; brown (7.5YR 4/4) very gravelly sandy clay loam, dark reddish brown (5YR 3/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; 40 percent gravel; slightly alkaline; clear wavy boundary.

Cr—24 inches; weakly consolidated granite.

The surface is 0 to 30 percent covered with gravel. The depth to bedrock ranges from 20 to 40 inches. The mollic epipedon is 7 to 14 inches thick. Reaction is neutral or slightly alkaline throughout the profile. The A horizon has hue of 10YR or 7.5YR; it is 0 to 15 percent gravel. The content of gravel in the individuval subhorizons of the Bt horizon is 10 to 45 percent; but when the amount of gravel in all the Bt horizons is averaged, it is 20 to 35 percent. The Bt horizon is 22 to 30 percent clay and 35 to 55 percent fine or coarser sand.

Luhon Series

The Luhon series consists of very deep, well drained soils on foot slopes, toe slopes, and terraces. They formed in alluvium. Slope ranges from 1 to 5 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Luhon soil, in an area of Luhon loam, 1 to 5 percent slopes, 100 feet east, 250 feet south of the northwest corner of sec. 36, T. 18 N., R. 74 W.

A—0 to 2 inches; pale brown (10YR 6/3) loam, dark yellowish brown (10YR 4/4) moist; weak medium platy structure parting to weak fine granular; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; abrupt smooth boundary.

AB—2 to 8 inches; light yellowish brown (10YR 6/4) loam, light olive brown (2.5Y 5/4) moist; moderate coarse subangular blocky structure; slightly hard, friable, sticky and plastic; few fine and medium roots; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bk2—8 to 34 inches; pale yellow (2.5Y 7/4) silt loam, olive yellow (2.5Y 6/6) moist; massive; slightly hard, friable, sticky and plastic; violently effervescent, calcium carbonate is disseminated and has a 28 percent carbonate equivalent; strongly alkaline; clear smooth boundary.

Bk3—34 to 60 inches; light yellowish brown (2.5Y 6/4) silt loam, light olive brown (2.5Y 5/6) moist; massive; slightly hard, friable, very sticky and plastic; violently effervescent, calcium carbonate is disseminated and has an 18 percent carbonate equivalent; strongly alkaline.

The particle-size control section is 20 to 30 percent clay and 15 to 35 percent fine or coarser sand. The hue is 10YR or 2.5Y throughout the profile. The A horizon has a slightly alkaline or moderately alkaline reaction. The Bk

horizon has a texture of silt loam or clay loam. Calcium carbonate equivalent in the Bk horizon is 15 to 30 percent.

Lupinto Series

The Lupinto series consists of very deep, well drained soils on fan terraces. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 7,000 to 7,500 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Lupinto gravelly fine sandy loam, in an area of Alcova, shallow substratum-Lupinto-Dahlquist complex, 0 to 8 percent slopes, 1,650 feet north, 100 feet west of the southeast corner of sec. 24, T. 16 N., R. 77 W.

A—0 to 2 inches; brown (10YR 5/3) gravelly fine sandy loam, dark brown (10YR 4/2) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; few fine roots; common very fine continuous irregular pores; 30 percent gravel; the surface is 10 percent covered with gravel; slightly alkaline; abrupt wavy boundary.

Bt—2 to 7 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common very fine and few fine continuous irregular pores; common faint clay films on faces of peds; 10 percent gravel; slightly alkaline; clear smooth boundary.

Bk1—7 to 15 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; common very fine and few fine continuous irregular pores; strongly effervescent, calcium carbonate is disseminated and also occurs as many thin (less than 1 mm) pendants on rock fragments; 40 percent gravel; strongly alkaline; clear wavy boundary.

Bk2—15 to 24 inches; very pale brown (10YR 7/3) very gravelly loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine continuous irregular pores; violently effervescent, calcium carbonate is disseminated and also occurs as many thin (less than 1 mm) pendants on rock fragments; 50 percent gravel; strongly alkaline; diffuse wavy boundary.

Bk3—24 to 36 inches; very pale brown (10YR 7/3) very gravelly sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and few fine continuous irregular pores; violently effervescent, calcium carbonate is disseminated and also occurs as many thin (less than 1 mm) pendants on rock fragments; 35 percent gravel and 10 percent cobbles; strongly alkaline; diffuse wavy boundary.

Bk4—36 to 48 inches; very pale brown (10YR 7/4) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; common very fine and few fine continuous irregular pores; violently effervescent, calcium carbonate is disseminated and also occurs as many thin (less than 1 mm) pendants on rock fragments; 35 percent gravel and 10 percent cobbles; strongly alkaline; clear wavy boundary.

Bk5—48 to 60 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam stratified with 15 percent thin discontinuous lenses of sandy loam and gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine continuous irregular pores; violently effervescent, calcium carbonate is disseminated and also occurs as many thin (less than 1 mm) pendants on rock fragments; 35 percent gravel; strongly alkaline.

The surface is 10 to 40 percent covered with gravel and cobbles. The particle-size control section averages 18 to 20 percent clay and 40 to 60 percent rock fragments. The calcium carbonate equivalent in the calcic horizon is 15 to 35 percent.

The A horizon has a neutral or slightly alkaline reaction. The Bt horizon has a texture of sandy clay loam or gravelly sandy clay loam. The Bk1 and Bk2 horizons have textures of very gravelly loam or very gravelly sandy clay loam. The Bk3 horizon has a texture of very gravelly sandy loam or extremely gravelly sandy loam. Reaction is moderately alkaline or strongly alkaline in the Bk horizons.

Luvar Series

The Luvar series consists of very deep, well drained soils on hillslopes. They formed in gypsiferous alluvium from various sources. Slope ranges from 1 to 8 percent. Elevation is 6,500 to 7,500 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Luvar loam, in an area of Luvar-Stylite-Diamonkit complex, 1 to 8 percent slopes, 1,475 feet west, 2,460 feet south of the northeast corner of sec. 12, T. 15 N., R. 76 W.

A—0 to 2 inches; dark brown (10YR 3/3) loam, brown (10YR 4/3) moist; weak very fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and few medium roots; many very fine discontinuous pores; the surface is 10

percent covered with gravel; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bw—2 to 6 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and few medium roots; many very fine discontinuous pores; slightly effervescent, calcium carbonate is disseminated; slightly alkaline; clear smooth boundary.

Bk1—6 to 12 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; moderate medium columnar structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; few fine roots, common very fine discontinuous roots; violently effervescent, calcium carbonate is disseminated and also occurs as many fine soft masses; 12 percent calcium carbonate equivalent; moderately alkaline; gradual wavy boundary.

Bk2—12 to 32 inches; very pale brown (10YR 8/3) clay loam, light yellowish brown (10YR 6/4) moist; weak medium columnar structure parting to weak medium subangular blocky; hard; friable, sticky and slightly plastic; few fine roots; common very fine discontinuous pores; violently effervescent, calcium carbonate is disseminated and also occurs as many medium and a few large soft masses, 17 percent calcium carbonate equivalent; strongly alkaline; clear smooth boundary.

By1—32 to 38 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, sticky and slightly plastic; few fine roots; common very fine discontinuous pores; strongly effervescent, calcium carbonate as few fine soft masses; gypsum as many medium and common large soft masses and few medium concretions; slightly alkaline; gradual wavy boundary.

By2—38 to 45 inches; light yellowish brown (2.5Y 6/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, sticky and slightly plastic; few fine roots; common very fine discontinuous pores; calcium carbonate as few fine soft masses; gypsum as common medium soft masses; 10 percent gravel; moderately alkaline; gradual wavy boundary.

By3—45 to 60 inches; light yellowish brown (2.5Y 6/4) clay loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, sticky and slightly plastic; few fine roots; few very fine discontinuous pores; slightly effervescent, carbonates disseminated; gypsum as common medium soft masses; moderately alkaline.

The hue is 10YR or 2.5Y throughout the profile. The A and Bw horizons have slightly alkaline or moderately alkaline reactions. The Bw, Bk, and By horizons have textures of loam or clay loam. Electrical conductivity in the Bk horizon is 2 to 8 millimhos per centimeter. Calcium carbonate equivalent in the Bk horizon is 10 to 20 percent. The By horizon has slightly alkaline to strongly alkaline reaction. Electrical conductivity in this horizon is 4 to 16 millimhos per centimeter. The By horizon is 15 to 25 percent gypsum.

Lymanson Series

The Lymanson series consists of moderately deep, well drained soils on fan terraces and hills. They formed in alluvium and residuum derived dominantly from sedimentary rock, but some areas are mantled with a thin layer of alluvium. Slope ranges from 5 to 20 percent. Elevation is 7,800 to 9,000 feet, average annual precipitation is 10 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Lymanson loam, in an area of Lymanson loam-Lymanson cobbly loam, complex, 6 to 20 percent slopes, 500 feet north, 400 feet east of the southwest corner of sec. 32, T. 16 N., R. 77 W.

A—0 to 7 inches; brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, friable, slightly sticky and slightly plastic; many very fine roots; common very fine pores; 6 percent gravel, 4 percent cobbles; the surface is 25 percent covered with 15 percent igneous gravel and 10 percent quartzite cobbles; slightly alkaline; abrupt wavy boundary.

Bt—7 to 16 inches; light yellowish brown (2.5Y 6/4) clay loam, light olive brown (2.5Y 5/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common very fine roots and pores; common faint clay films on faces of peds; slightly alkaline; clear wavy boundary.

Btk—16 to 31 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; few fine distinct olive yellow (2.5Y 6/6) lithochromic mottles; moderate medium prismatic and angular blocky structure; very hard, firm, sticky and plastic; common very fine roots; few very fine pores; common faint clay films on faces of peds; strongly effervescent, few fine soft masses of calcium carbonate; moderately alkaline; clear wavy boundary.

Bk—31 to 35 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; common fine distinct light gray (2.5Y 7/1) and olive yellow (2.5Y 6/6) lithochromic mottles; massive; hard, firm, sticky and plastic; few very fine roots; strongly effervescent, common fine soft masses of calcium carbonate; 25

percent soft fine shale fragments; strongly alkaline; diffuse wavy boundary.

Cr—35 to 60 inches; light brownish gray (2.5Y 6/2) weakly consolidated shale.

The surface is 0 to 50 percent covered with gravel and cobbles. In some areas, a few stones are also on the surface. The The depth to horizons containing secondary calcium carbonate ranges from 15 to 26 inches. The depth to bedrock ranges from 20 to 40 inches. The mollic epipedon is 7 to 11 inches thick.

The A horizon has a neutral to moderately alkaline reaction. This horizon is 0 to 20 percent gravel and 0 to 20 percent cobbles. The Bt horizon has hue of 2.5Y or 10YR. It has a slightly alkaline or moderately alkaline reaction. The Bt horizon commonly has a texture of clay loam, but it is gravelly sandy clay loam in some pedons. It is 20 to 35 percent clay, 25 to 35 percent fine or coarser sand, and 0 to 25 percent coarse fragments.

This soil in map unit 233 is outside the characteristics of the Lymanson series because the Bk horizon is very gravelly loam and 35 to 50 percent gravel.

Manada Series

The Manada series consists of very deep, somewhat poorly drained soils on fan terraces. They formed in alluvium. Slope ranges from 0 to 6 percent. Elevation is 7,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Manada soil, in an area of Manada sandy loam, 0 to 6 percent slopes, 1,300 feet east, 1,000 feet south of the northwest corner of sec. 23, T. 16 N., R. 76 W.

A—0 to 2 inches; dark grayish brown (10YR 4/2) sandy loam, very dark grayish brown (10YR 3/2) moist; few fine distinct yellowish red (5YR 4/6) mottles; moderate fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; few fine pores; strongly effervescent; 5 percent fine gravel; moderately alkaline; abrupt smooth boundary.

Bw—2 to 9 inches; brown (10YR 4/3) loam, dark brown (10YR 3/3) moist; moderate medium and fine subangular blocky structure; common fine distinct yellowish red (5YR 4/6) mottles; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots and pores; slightly effervescent, carbonate equivalent is less than 2 percent; 10 percent fine gravel; moderately alkaline; clear smooth boundary.

Bk1—9 to 15 inches; very pale brown (10YR 7/3) gravelly sandy loam, pale brown (10YR 6/3) moist; weak medium subangular blocky structure; few fine distinct strong brown (7.5YR 5/6) mottles; slightly hard, friable, nonsticky and nonplastic; common fine and very fine roots and pores; violently effervescent, calcium carbonate is disseminated and the carbonate equivalent is 9 percent; 15 percent fine gravel; moderately alkaline; clear wavy boundary.

Bk2—15 to 27 inches; light gray (10YR 7/2) gravelly sandy loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure; hard, friable, slightly sticky and slightly plastic; common fine and very fine roots and pores; violently effervescent, common fine concretions of calcium carbonate, calcium carbonate equivalent is 8 percent; 20 percent fine gravel; strongly alkaline; gradual wavy boundary.

Bk3—27 to 35 inches; white (10YR 8/2) gravelly loam, very pale brown (10YR 7/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; few fine and very fine pores; violently effervescent, common fine concretions of calcium carbonate, calcium carbonate equivalent is 26 percent; 20 percent medium and fine gravel; strongly alkaline; gradual wavy boundary.

Bk4—35 to 60 inches; very pale brown (10YR 7/3) gravelly sandy loam, pale brown (10YR 6/3) moist; massive; hard, friable, nonsticky and nonplastic; few fine and very fine pores; violently effervescent, few fine concretions of calcium carbonate, calcium carbonate equivalent is 10 percent; 15 percent fine gravel; strongly alkaline.

The mollic epipedon is 8 to 10 inches thick. The particle-size control section is 10 to 15 percent clay, 45 to 65 percent fine or coarser sand, and 10 to 20 percent rock fragments. The depth to a seasonal high water table ranges from 2 to 3 feet from April through July. The Bw horizon commonly has a texture of loam, but in some pedons it is sandy loam. The Bk horizon has hue of 10YR or 2.5Y. It commonly has a texture of gravelly sandy loam or gravelly loam, but in some pedons it is sandy loam or fine sandy loam. The Bk horizon is 1 to 20 percent gravel. Reaction in the Bk horizon is moderately alkaline or strongly alkaline. The calcium carbonate equivalent in some parts of the Bk horizon is 15 to 30 percent.

McFadden Series

The McFadden series consists of very deep, well drained soils on fan terraces. They formed in alluvium. Slope ranges from 1 to 6 percent. Elevation is 7,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the McFadden soil, in an area of McFadden gravelly fine sandy loam, 1 to 6 percent slopes,

2,480 feet north, 20 feet east of the southwest corner of sec. 33, T. 16 N., R. 76 W.

A—0 to 5 inches; brown (10YR 5/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; strongly effervescent, calcium carbonate equivalent is less than 2 percent; 15 percent gravel; moderately alkaline; abrupt smooth boundary.

Bk1—5 to 9 inches; pale brown (10YR 6/3) gravelly fine sandy loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine roots; violently effervescent, calcium carbonate equivalent is 12 percent; 25 percent gravel; moderately alkaline; clear smooth boundary.

Bk2—9 to 18 inches; very pale brown (10YR 7/3) gravelly fine sandy loam, pale brown (10YR 6/3) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine roots; violently effervescent, calcium carbonate equivalent is 28 percent; 30 percent gravel; moderately alkaline; clear smooth boundary.

2B3k—18 to 60 inches; light gray (10YR 7/2) loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; violently effervescent, calcium carbonate equivalent is 25 percent; 10 percent gravel; strongly alkaline.

The surface is 15 to 35 percent covered with gravel and cobbles. The particle-size control section is 10 to 17 percent clay. The Bk horizon commonly has a texture of gravelly loam or gravelly fine sandy loam, but in some pedons the texture is loam. This horizon is 10 to 35 percent gravel. Calcium carbonate equivalent in the Bk horizon ranages from 10 to 30 percent, but at least some parts have more than 15 percent. The 2Bk3 horizon is absent in some pedons.

Miracle Series

The Miracle series consists of moderately deep, well drained soils on ridges, mountain slopes, canyon sides, and cuestas. They formed in residuum, colluvium, and alluvium derived from reddish sandstone, limestone, and shale. Slope ranges from 5 to 40 percent. Elevation is 7,600 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Miracle fine sandy loam, in an area of Miracle-Cheadle association, 5 to 20 percent slopes, 1,300 feet south, 1,300 feet west of the northeast corner of sec. 27, T. 15 N., R. 72 W.

A—0 to 4 inches; brown (10YR 4/3) fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine, fine, and common medium roots; slightly alkaline; abrupt smooth boundary.

Bt1—4 to 12 inches; brown (7.5YR 4/4) sandy clay loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; many faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—12 to 21 inches; red (2.5YR 4/6) sandy clay loam, dark red (2.5YR 3/6) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; hard, friable, sticky and slightly plastic; few fine and medium roots; many distinct and few prominent clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt3—21 to 28 inches; reddish brown (5YR 4/4) sandy clay loam, reddish brown (5YR 4/4) moist; moderate coarse subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; few faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bk—28 to 33 inches; reddish brown (5YR 5/4) sandy loam, reddish brown (5YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; slightly effervescent, calcium carbonate as few thin pendants on gravel; 5 percent gravel; slightly alkaline; abrupt wavy boundary.

R—33 inches; hard red sandstone.

The surface is 0 to 10 percent covered with cobbles and stones. The depth to bedrock ranges from 20 to 40 inches. Reaction is neutral or slightly alkaline throughout the profile. The mollic epipedon is 7 to 12 inches thick. The Bt horizon is 20 to 25 percent clay and 0 to 10 percent rock fragments. The Bk horizon is absent in some pedons.

Morset Series

The Morset series consists of very deep, well drained soils on toe slopes of hills. They formed in alluvium derived from granitic and sedimentary sources. Slope ranges from 3 to 10 percent. The elevation is 7,400 to 8,200 feet, annual precipitation is 10 to 17 inches, and the annual air temperature is 38 to 40 degrees F. The frost-free period is less than 60 days.

Typical pedon of Morset gravelly sandy loam, in an area of Rainbolt-Morset association, 3 to 25 percent slopes, 1,900 feet east, 2,325 feet south of the northwest corner of sec. 24, T. 14 N., R. 77 W.

A—0 to 2 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; few very fine discontinuous pores; 25 percent gravel; slightly alkaline; abrupt smooth boundary.

Bt1—2 to 6 inches; dark grayish brown (10YR 4/2) gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; many fine roots; common very fine discontinuous pores; few faint clay films on faces of peds and as bridges between sand grains; 30 percent gravel; slightly alkaline; abrupt smooth boundary.

Bt2—6 to 13 inches; brown (10YR 4/3) gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular block structure; slightly hard, firm, sticky and slightly plastic; common fine roots; many very fine discontinuous pores; common distinct clay films on faces of peds; 30 percent gravel; moderately alkaline; gradual smooth boundary.

Btk1—13 to 24 inches; very pale brown (10YR 7/3) gravelly sandy clay loam, light yellowish brown (10YR 6/4) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and slightly plastic; few fine roots; common very fine discontinuous pores; few faint clay films coated by calcium carbonate on faces of peds; violently effervescent, calcium carbonate is disseminated and occurs as coatings on gravel, 24 percent calcium carbonate equivalent by calcimeter method; 30 percent gravel; moderately alkaline; gradual smooth boundary.

Btk2—24 to 28 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, firm, sticky and slightly plastic; few fine roots; common very fine discontinuous pores; few faint clay films on faces of peds and as bridging between sand grains; violently effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses and coatings on gravel, 7 percent calcium carbonate equivalent by calcimeter; 30 percent gravel; moderately alkaline; gradual smooth boundary.

Bk1—28 to 39 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, firm, sticky and slightly plastic; few very fine roots; few very fine discontinuous pores; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses and coatings on gravel; 25 percent gravel; moderately alkaline; gradual smooth boundary.

Bk2—39 to 60 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, firm, sticky and slightly plastic; few very fine discontinuous pores; strongly effervescent, calcium carbonate is disseminated and also occurs as coatings on gravel; 17 percent gravel; moderately alkaline.

The mollic epipedon is 10 to 13 inches thick. The particle-size control section is 20 to 35 percent clay and 35 to 55 percent fine or coarser sand. The A horizon is 15 to 30 percent gravel. The Bt horizon is 15 to 35 percent gravel. The Bt horizon has a slightly alkaline or moderately alkaline reaction. The Bk horizon commonly has a texture of gravelly sandy clay loam, but in some pedons it is gravelly sandy loam. This horizon is 15 to 35 percent gravel. The Bk horizon has a is moderately alkaline or strongly alkaline reaction. Calcium carbonate equivalent is 15 to 25 percent in at least part of the Btk or Bk horizons.

Moyerson Series

The Moyerson series consists of shallow, well drained soils on escarpments. They formed in residuum and alluvium derived from shale. Slope ranges from 3 to 20 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Moyerson silty clay loam, in an area of Moyerson-Kemmerer complex, 3 to 20 percent slopes, 2,350 feet south, 300 feet west of the northeast corner of sec. 27, T. 25 N., R. 76 W.

A—0 to 4 inches; light brownish gray (2.5Y 6/2) silty clay loam, grayish brown (2.5Y 5/2) moist; weak fine subangular blocky structure; soft, friable, sticky and plastic; few fine roots; the surface is 15 percent covered with igneous gravel, cobbles, and slate fragments; strongly effervescent, calcium carbonate is disseminated; slightly alkaline; abrupt smooth boundary.

AC—4 to 10 inches; light brownish gray (2.5Y 6/2) silty clay, grayish brown (2.5Y 5/2) moist; massive; slightly hard, firm, sticky and plastic; few fine roots; strongly effervescent, calcium carbonate is disseminated; 80 percent soft shale fragments that break down when wetted; moderately alkaline; clear smooth boundary.

C—10 to 17 inches; light gray (5Y 6/1) silty clay, gray (5Y 5/1) moist; massive; hard, firm, sticky and plastic; few fine roots; strongly effervescent, calcium carbonate is disseminated; few fine soft masses of gypsum; 95 percent soft shale fragments

that break down when wetted; moderately alkaline; gradual smooth boundary.

Cr—17 to 60 inches; weakly consolidated shale.

The surface is 0 to 15 percent covered with igneous gravel, cobbles, and channers. The depth to bedrock ranges from 10 to 20 inches. The particle-size control section is 35 to 45 percent clay and 10 to 30 percent fine or coarser sand. The A horizon has a slightly alkaline or moderately alkaline reaction. The C horizon has a texture of silty clay or clay loam. It has a moderately alkaline or strongly alkaline reaction.

Nathale Series

The Nathale series consists of moderately deep, well drained soils on mountain slopes and canyon sides. They formed in residuum and colluvium derived from limestone and sandstone. Slope ranges from 10 to 60 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Nathale gravelly fine sandy loam, in an area of Nathale-Passcreek, cobbly subsoil-Rock outcrop complex, 10 to 60 percent slopes, 1,500 feet south, 1,900 feet west of the northeast corner of sec. 23, T. 15 N, R. 72 W.

A—0 to 4 inches; brown (10YR 4/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine and common medium roots; slightly effervescent, calcium carbonate is disseminated; 30 percent gravel; the surface is 60 percent covered with gravel and cobbles; moderately alkaline; clear smooth boundary.

Bt—4 to 11 inches; brown (10YR 5/3) very cobbly very fine sandy loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common distinct clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated; 25 percent angular cobbles and 15 percent gravel; moderately alkaline; clear smooth boundary.

Bk1—11 to 17 inches; pale brown (10YR 6/3) very cobbly very fine sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and medium roots; strongly effervescent, calcium carbonate is disseminated and also occurs as pendants on rock fragments; 25 percent cobbles and 15 percent gravel; moderately alkaline; clear smooth boundary.

Bk2—17 to 24 inches; pale brown (10YR 6/3) very cobbly fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; violently effervescent, calcium carbonate is disseminated and also occurs as pendants on rock fragments; 40 percent cobbles and 20 percent gravel; moderately alkaline; abrupt irregular boundary.

R—24 inches; fractured hard limestone.

The surface is 60 to 90 percent covered with gravel, cobbles, or stones. The depth to bedrock ranges from 20 to 40 inches. The mollic epipedon is 9 to 11 inches thick.

The A and Bt horizons have slightly alkaline or moderately alkaline reactions. The Bt horizon commonly has a texture of very cobbly very fine sandy loam, but in some pedons it is very cobbly loam or very cobbly sandy clay loam. This horizon is 5 to 15 percent gravel and 20 to 45 percent cobbles.

The Bk horizon is 10 to 20 percent gravel, 25 to 50 percent cobbles, and 0 to 10 percent stones. It has a fine-earth texture of sandy loam or fine sandy loam. Calcium carbonate equivalent in this horizon is 10 to 20 percent.

Pahlow Series

The Pahlow series consists of very deep, well drained soils on terraces with a mounded microrelief. They formed in alluvium. Slope ranges from 0 to 3 percent. Elevation is 7,000 to 7,500 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Pahlow soil, in an area of Pahlow gravelly sandy loam, 0 to 3 percent slopes, 1,525 feet west, 1,625 feet south of the northeast corner of sec. 30, T. 14 N., R. 76 W.

A—0 to 3 inches; brown (10YR 4/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and few medium roots; many very fine discontinuous pores; 15 percent gravel; the surface is 25 percent covered with gravel; slightly alkaline; abrupt smooth boundary.

Bw1—3 to 7 inches; brown (10YR 5/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; many fine and few medium roots; many very fine discontinuous pores; 35 percent gravel and 5 percent cobbles; slightly alkaline; clear smooth boundary.

Bw2—7 to 15 inches; dark yellowish brown (10YR 4/4) very gravelly sandy loam, brown (10YR 4/3) moist;

weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots; common very fine and fine continuous pores; noneffervescent matrix with calcium carbonate as few thin coatings on undersides of rock fragments; 40 percent gravel and 10 percent cobbles; slightly alkaline; clear smooth boundary.

2Bk1—15 to 25 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; very few fine roots; many very fine and fine continuous pores; slightly effervescent, calcium carbonate is disseminated and also occurs as common moderately thick pendants and coatings on undersides of rock fragments; 50 percent gravel and 5 percent cobbles; moderately alkaline; gradual smooth boundary.

2Bk2—25 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; very few fine roots; many very fine and fine continuous pores; violently effervescent, calcium carbonate is disseminated and also occurs as common moderately thick pendants and coatings on undersides of rock fragments; 50 percent gravel and 10 percent cobbles; moderately alkaline.

The surface is 0 to 25 percent covered with gravel. In some areas, a thick mat of roots is on the surface. The rock fragments throughout the profile are dominantly granite, schist, or quartzite. The A and Bw horizons have slightly alkaline or moderately alkaline reactions. The calcium carbonate equivalent in the 2Bk horizon is 10 to 25 percent. Reaction in this horizon is moderately alkaline or strongly alkaline.

Passcreek Series

The Passcreek series consists of moderately deep, well drained soils on mountain slopes, canyon sides, and cuesta dip slopes. They formed in residuum and colluvium derived from limestone and sandstone. Slope ranges from 5 to 60 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Passcreek fine sandy loam cobbly subsoil, in an area of Cheadle-Passcreek, cobbly subsoil-Rock outcrop complex, 5 to 25 percent slopes, 600 feet north, 500 feet west of the southeast corner of sec. 17, T. 15 N., R. 72 W.

A—0 to 4 inches; brown (10YR 4/3) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; slightly effervescent, calcium carbonate is disseminated; 5 percent gravel and 5 percent cobbles; the surface is 50 percent covered with cobbles and stones; moderately alkaline; clear smooth boundary.

Bt—4 to 11 inches; brown (10YR 4/3) sandy clay loam, dark brown (7.5YR 3/2) moist; moderate coarse prismatic structure parting to moderate coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; many faint clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated; 5 percent gravel and 5 percent cobbles; moderately alkaline; clear irregular boundary.

Bk1—11 to 14 inches; brown (7.5YR 4/4) very cobbly fine sandy loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few fine roots; strongly effervescent, calcium carbonate is disseminated and also occurs as pendants on rock fragments; 40 percent cobbles and 20 percent gravel; moderately alkaline; gradual irregular boundary.

Bk2—14 to 22 inches; light yellowish brown (10YR 6/4) very cobbly fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; strongly effervescent, calcium carbonate is disseminated and also occurs as pendants on rock fragments; 40 percent cobbles and 20 percent gravel; moderately alkaline; abrupt irregular boundary.

R—22 inches; hard limestone.

The surface is 10 to 90 percent covered with cobbles and stones. The depth to bedrock ranges from 20 to 40 inches. The mollic epipedon is 7 to 11 inches thick. Reaction is slightly alkaline or moderately alkaline throughout the profile. The Bt and Bk horizons have hue of 10YR or 7.5YR. The Bt horizon has a texture of cobbly fine sandy loam, cobbly sandy clay loam, or sandy clay loam. It is 0 to 10 percent gravel and 0 to 10 percent cobbles. The Bk horizon is 35 to 50 percent rock fragments. The rock fragments in this horizon consist of 10 to 25 percent gravel and 35 to 50 percent cobbles.

Pilotpeak Series

The Pilotpeak series consists of very shallow or shallow and well drained soils on cuesta dip slopes and structural benches. They formed in residuum and colluvium derived from limestone. Slope ranges from 3 to 25 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Pilotpeak cobbly very fine sandy loam, in an area of Pilotpeak-Canwall complex, 3 to 20 percent

slopes, 2,000 feet west, 1,900 feet north of the southeast corner of sec. 12, T. 16 N., R. 73 W.

A—0 to 4 inches; yellowish brown (10YR 5/4) cobbly very fine sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; slightly effervescent, calcium carbonate is disseminated; 10 percent coarse gravel and 20 percent 3- to 6-inch cobbles; the surface is 60 percent covered with gravel and cobbles; moderately alkaline; gradual wavy boundary.

Bk1—4 to 14 inches; brown (10YR 5/3) very cobbly very fine sandy loam, dark yellowish brown (10YR 3/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; strongly effervescent, calcium carbonate as common fine masses and thin pendants on undersides of rock fragments; 15 percent coarse gravel and 25 percent 3- to 6-inch cobbles; moderately alkaline; abrupt smooth boundary.

Bk2—14 to 18 inches; pale brown (10YR 6/3) extremely cobbly very fine sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few medium roots; violently effervescent, calcium carbonate as thick pendants on underside of rock fragments and as many fine soft masses in the matrix; 15 percent coarse gravel and 45 percent 3- to 6-inch cobbles; strongly alkaline; abrupt smooth boundary.

R—18 inches; limestone bedrock.

The surface is 20 to 60 percent covered with coarse gravel and 3- to 6-inch angular cobbles and channers. The depth to bedrock ranges from 7 to 20 inches. The hue is 2.5YR to 10YR in the A horizon and 7.5YR or 10YR in the Bk horizon. The Bk horizon has a fine-earth texture of fine sandy loam or very fine sandy loam; it is 40 to 70 percent rock fragments. Calcium carbonate equivalent in the Bk horizon is 15 to 35 percent. The Bk horizon has a moderately alkaline or strongly alkaline reaction.

Pinelli Series

The Pinelli series consists of very deep, well drained soils on alluvial flats and pediments and in small playas. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Pinelli soil, in an area of Pinelli clay loam, 0 to 6 percent slopes, 2,000 feet north, 650 feet west of the southeast corner of sec. 34, T. 25 N., R. 76 W.

A—0 to 3 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; weak fine subangular blocky structure; soft, friable, sticky and plastic; strongly effervescent, calcium carbonate is disseminated; slightly alkaline; clear smooth boundary.

AB—3 to 6 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bt1—6 to 13 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; moderate medium angular blocky structure; very hard, firm, sticky and plastic; common distinct clay films on faces of ped; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bt2—13 to 18 inches; light brownish gray (2.5Y 6/2) silty clay, grayish brown (2.5Y 5/2) moist; strong coarse subangular blocky structure; very hard, very firm, sticky and plastic; many distinct clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Btk—18 to 28 inches; light brownish gray (2.5 Y 6/2) silty clay, grayish brown (2.5Y 5/2) moist; moderate medium prismatic structure; hard, very firm, sticky and plastic; few faint clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine masses; moderately alkaline; gradual smooth boundary.

Bk—28 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, grayish brown (2.5Y 5/2) moist; massive; hard, firm, sticky and plastic; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses; moderately alkaline.

The A horizon has hue of 10YR or 2.5Y; it is 0 to 5 percent gravel. The A and Bt horizons have slightly alkaline or moderately alkaline reactions. The Bt horizon has hue of 7.5YR to 2.5Y. It commonly has a texture of clay or silty clay, but in some pedons it is clay loam. The Bt horizon is 35 to 50 percent clay.

Poin Series

The Poin series consists of shallow, well drained soils on mountain slopes. They formed in colluvium and residuum derived from gneiss and schist. Slope ranges from 15 to 50 percent. Elevation is 7,600 to 8,800 feet,

average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Poin very cobbly sandy loam, in an area of Poin-Bowen-Rock outcrop complex, 10 to 50 percent slopes, 1,620 feet east, 1,390 feet north of the southwest corner of sec. 24, T. 13 N., R. 77 W.

A—0 to 6 inches; dark brown (10YR 4/3) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak fine granular; soft, very friable, nonsticky and nonplastic; many fine roots; 35 percent cobbles and 10 percent gravel; neutral; clear smooth boundary.

C—6 to 15 inches; dark grayish brown (10YR 4/2) very channery sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, nonsticky and nonplastic; common fine roots; 60 percent channers; neutral; clear wavy boundary.

R—15 inches; hard schist bedrock.

The depth to bedrock ranges from 10 to 20 inches. The particle-size control section is 10 to 15 percent clay and 40 to 60 percent rock fragments.

Poposhia Series

The Poposhia series consists of very deep, well drained soils on hills, ridges, and fan aprons. They formed in alluvium. Slope ranges from 2 to 30 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Poposhia sandy loam, in an area of Poposhia-Chaperton association, 6 to 12 percent slopes, 1,600 feet east, 1,450 feet north of the southwest corner of sec. 27, T. 21 N., R. 75 W.

A1—0 to 1 inch; yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; vesicular crust; soft, very friable, slightly sticky and slightly plastic; many fine and few medium roots; common very fine and fine continuous irregular pores; the surface is 10 percent covered with gravel and cobbles; moderately alkaline; abrupt smooth boundary.

A2—1 to 5 inches; dark yellowish brown (10YR 4/4) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure parting to weak fine and medium granular; soft, friable, sticky and plastic; many fine and few medium roots; common very fine and fine continuous irregular pores; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bk1—5 to 15 inches; brown (10YR 5/3) loam, olive brown (2.5Y 4/4) moist; moderate medium and coarse subangular blocky structure parting to weak fine and medium granular; slightly hard, friable, sticky and plastic; many fine and few medium roots; common very fine and fine continuous irregular pores; strongly effervescent, calcium carbonate is disseminated and also occurs as many (25 percent) light gray (10YR 7/2) fine soft masses, 9 percent calcium carbonate equivalent by the calcimeter method; strongly alkaline; gradual smooth boundary.

Bk2—15 to 29 inches; grayish brown (2.5Y 5/2) loam, olive (5Y 4/4) moist; weak medium and coarse prismatic structure; slightly hard, friable, sticky and plastic; many fine and few medium roots to 20 inches, few fine and medium roots below; common very fine and fine continuous irregular pores; strongly effervescent, calcium carbonate is disseminated and has a 9 percent calcium carbonate equivalent by the calcimeter method; strongly alkaline; gradual smooth boundary.

C—29 to 60 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, sticky and plastic; few fine and medium roots; common very fine and fine continuous irregular pores; slightly effervescent, calcium carbonate is disseminated; strongly alkaline.

The particle-size control section is 18 to 30 percent clay and 15 to 35 percent fine or coarser sand. The A horizon has a slightly alkaline or moderately alkaline reaction. The Bk and C horizons have hue of 10YR or 2.5Y. Textures in the Bk and C horizons are loam, sandy clay loam, or clay loam. The Bk and C horizons have moderately alkaline or strongly alkaline reactions.

Quander Series

The Quander series consists of very deep, well drained soils on outwash fan terraces. They formed in glacial drift. Slope ranges from 3 to 45 percent. Elevation is 7,800 to 8,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Quander gravelly loam, in an area of Hanson-Quander complex, 3 to 15 percent slopes, 1,600 feet south, 1,150 feet east of the northwest corner of sec. 21, T. 17 N., R. 77 W.

A—0 to 3 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine continuous irregular pores; 25 percent gravel; the surface is 40 percent covered with gravel and 5 percent covered with cobbles and stones; neutral; clear smooth boundary.

AB—3 to 12 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine continuous irregular pores; 15 percent gravel; neutral; abrupt wavy boundary.

Bt1—12 to 17 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, yellowish brown (10YR 5/4) moist; moderate medium prismatic structure parting to moderate medium angular blocky; hard, firm, sticky and plastic; few fine roots; common very fine and fine continuous irregular pores; many distinct clay films on faces of peds; 10 percent gravel and 25 percent cobbles; neutral; clear wavy boundary.

Bt2—17 to 26 inches; reddish yellow (7.5YR 6/6) very cobbly clay loam, strong brown (7.5YR 5/6) moist; weak medium angular blocky structure; hard, friable, sticky and plastic; few fine roots; few very fine continuous irregular pores; few faint clay films on faces of peds; 15 percent gravel and 40 percent cobbles; neutral; gradual wavy boundary.

BC—26 to 35 inches; mixed reddish yellow (7.5YR 6/6) and light gray (10YR 7/2) very cobbly clay loam, mixed strong brown (7.5YR 5/6) and pale brown (10YR 6/3) moist; weak medium subangular blocky structure; very hard, firm, sticky and plastic; 10 percent gravel and 45 percent cobbles; slightly alkaline; gradual wavy boundary.

C—35 to 60 inches; yellow (2.5Y 7/6) very cobbly sandy clay loam, olive yellow (2.5Y 6/6) moist; massive; hard, friable, sticky and plastic; 15 percent gravel and 30 percent cobbles; slightly alkaline.

The surface is 40 to 50 percent covered with gravel, cobbles, and stones. The mollic epipedon is 10 to 12 inches thick. The Bt horizon has hue of 10YR or 7.5YR. It has a texture of very cobbly clay loam or very gravelly clay loam. The Bt horizon is 35 to 55 percent rock fragments. The C horizon commonly has a texture of very cobbly sandy clay loam, but in some pedons it is very cobbly clay loam. It has a neutral or slightly alkaline reaction. The C horizon has hue of 2.5Y or 10YR.

Rainbolt Series

The Rainbolt series consists of moderately deep, well drained soils on back slopes and foot slopes of hills. They formed in alluvium from granitic and sedimentary sources. Slope ranges from 3 to 25 percent. Elevation is 7,400 to 8,200 feet, average annual precipitation is 10 to 17 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Rainbolt gravelly sandy loam in an area of Rainbolt-Morset association, 3 to 25 percent slopes, 2,325 feet east, 1,100 feet north of the southwest corner of sec. 32, T. 13 N., R. 76 W.

A—0 to 2 inches; brown (7.5YR 5/3) gravelly sandy loam, dark brown (7.5YR 3/2) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and nonplastic; many fine roots; many very fine continuous pores; 20 percent gravel; the surface is 15 percent covered with gravel; slightly alkaline; abrupt smooth boundary.

Bt1—2 to 9 inches; dark brown (7.5YR 4/3) gravelly sandy clay loam, dark brown (7.5YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; common very fine continuous pores; few faint clay films on faces of peds; 20 percent gravel; moderately alkaline; clear smooth boundary.

Bt2—9 to 16 inches; reddish brown (2.5YR 4/4) gravelly sandy clay loam, reddish brown (2.5YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and slightly plastic; common fine roots; common very fine continuous pores; common distinct clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated; 25 percent gravel; moderately alkaline; clear smooth boundary.

Bk—16 to 28 inches; reddish brown (2.5YR 4/4) sandy clay loam, dark reddish brown (2.5YR 3/4) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine roots; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine and medium small masses; 10 percent gravel; strongly alkaline; clear smooth boundary.

Cr-28 inches; weakly consolidated reddish sandstone.

The surface is 10 to 20 percent covered with granitic gravel. The depth to bedrock ranges from 20 to 40 inches. The mollic epipedon is 7 to 15 inches thick. The A horizon has a slightly alkaline or moderately alkaline reaction. The Bt and Bk horizons have moderately alkaline or strongly alkaline reactions. The Bt horizon has a texture of gravelly sandy clay loam or sandy clay loam. It is 20 to 28 percent clay, 35 to 55 percent fine or coarser sand, and 5 to 25 percent rock fragments.

Rawlins Series

The Rawlins series consists of very deep, well drained soils on fan terraces. They formed in alluvium. Slope ranges from 3 to 8 percent. Elevation is 6,800 to 7,800 feet, average annual precipitation is 15 to 19 inches, and

average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Rawlins sandy loam, in an area of Dahlquist-Rawlins-Browtine complex, moist, 3 to 15 percent slopes, 2,400 feet south, 150 feet west of the northeast corner of sec. 15, T. 20 N., R. 77 W.

A—0 to 2 inches; brown (10YR 5/3) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few fine roots and pores; slightly alkaline; abrupt smooth boundary.

Bt—2 to 9 inches; yellowish brown (10YR 5/4) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine roots and pores; many faint clay films on faces of peds; slightly alkaline; gradual smooth boundary.

Bk1—9 to 18 inches; pale yellow (2.5Y 7/4) very fine sandy loam, light yellowish brown (2.5Y 6/4) moist; weak medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots and pores; violently effervescent, calcium carbonate as many medium soft masses, calcium carbonate equivalent is 12 percent; strongly alkaline; gradual smooth boundary.

Bk2—18 to 24 inches; pale yellow (2.5Y 7/4) fine sandy loam, light yellowish brown (2.5Y 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; few fine oxide stains; violently effervescent, calcium carbonate as many fine soft masses, calcium carbonate equivalent is 11 percent; strongly alkaline; diffuse smooth boundary.

Bk3—24 to 48 inches; pale yellow (2.5Y 7/4) fine sandy loam, light yellowish brown (2.5Y 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; common medium oxide stains; strongly effervescent, calcium carbonate as common fine soft masses; moderately alkaline; diffuse smooth boundary.

Bk4—48 to 60 inches; yellow (10YR 7/6) fine sandy loam, light yellowish brown (10YR 6/4) moist; massive; soft, very friable, nonsticky and nonplastic; slightly effervescent, calcium carbonate as few fine filaments; 10 percent coarse sandstone gravel; strongly alkaline.

The surface is 5 to 20 percent covered with medium and coarse gravel and a few cobbles. The particle-size control section averages 12 to 18 percent clay, 50 to 75 percent fine or coarser sand, and 0 to 5 percent rock fragments. The calcium carbonate equivalent in the calcic horizon is 10 to 15 percent. Reaction is neutral or mildly alkaline in the A horizon and moderately alkaline or strongly alkaline in the Bk horizon. The Bk horizon has hue of 10YR or 2.5Y. It is 0 to 10 percent gravel.

Redfeather Series

The Redfeather series consists of shallow, well drained soils on foothills and mountain slopes. They formed in residuum and colluvium derived from granite. Slope ranges from 5 to 50 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Redfeather gravelly sandy loam, in an area of Lakehelen-Redfeather-Amesmont complex, 5 to 20 percent slopes, 900 feet east, 2,600 feet south of the northwest corner of sec. 29, T. 15 N., R. 71 W.

Oi—2 inches to 1; undecomposed needles, twigs, bark, and other forest litter.

Oe—1 inch to 0; decomposed organic matter.

E—0 to 7 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium platy structure parting to weak fine platy; soft, very friable, nonsticky and nonplastic; many medium and common coarse roots; 20 percent gravel; neutral; clear wavy boundary.

E/B—7 to 14 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium platy structure; soft, very friable, nonsticky and nonplastic; interfingered with yellowish brown (10YR 5/6) very gravelly sandy loam, dark yellowish brown (10YR 4/6) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common coarse roots; 30 percent gravel; neutral; abrupt irregular boundary.

Bt—14 to 19 inches; brown (7.5YR 4/4) very gravelly sandy clay loam, dark brown (7.5YR 3/4) moist; strong coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few coarse roots; common prominent clay films on faces of peds; 60 percent gravel; neutral; abrupt wavy boundary.

R—19 inches; hard granite.

The depth to bedrock ranges from 10 to 20 inches. The Bt horizon is 20 to 30 percent clay and 40 to 60 percent rock fragments.

Redrob Series

The Redrob series consists of very deep, poorly drained soils on low stream terraces and flood plains. They formed in alluvium. Slope ranges from 0 to 3 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Redrob loam, in an area of Redrob, frequently flooded-Redrob loams, 0 to 3 percent slopes, 1,600 feet north, 2,600 feet west of the southeast corner of sec. 23, T. 15 N., R. 74 W.

A1—0 to 2 inches; grayish brown (10YR 5/2) loam, dark grayish brown (2.5Y 4/2) moist; weak medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; slightly effervescent, calcium carbonate is disseminated; few thin seams of soluble salts; electrical conductivity is 3.8 millimhos per centimeter; moderately alkaline; abrupt smooth boundary.

A2—2 to 8 inches; very dark grayish brown (10YR 3/2) loam, black (10YR 2/1) moist; strong coarse granular structure; interfingered with dark grayish brown (2.5Y 4/2) loam, dark brown (10YR 3/3) moist; massive; slightly hard, friable, sticky and plastic; common very fine, fine, and medium roots; strongly effervescent, calcium carbonate is disseminated; few thin seams of soluble salts; electrical conductivity is 2.3 millimhos per centimeter; 5 percent fine gravel; strongly alkaline; clear irregular boundary.

A3—8 to 18 inches; dark grayish brown (2.5Y 4/2) loam, very dark brown (2.5Y 3/2) moist; common fine faint black (2.5Y 2/1) moist and few fine prominent strong brown (7.5YR 5/8) moist, mottles; weak coarse subangular blocky structure; hard, firm, sticky and slightly plastic; few fine and medium roots; strongly effervescent, calcium carbonate is disseminated; few thin seams of soluble salt; electrical conductivity is 2.0 millimhos per centimeter; 5 percent fine gravel; strongly alkaline; gradual smooth boundary.

Cg—18 to 25 inches; light olive brown (2.5Y 5/4) sandy clay loam, olive brown (2.5Y 4/4) moist, few fine faint black (2.5Y 2/1), moist, and common medium strong brown (7.5YR 5/8), moist, mottles; massive; hard, firm, sticky and plastic; few fine and medium roots; moderately alkaline; clear wavy boundary.

2C—25 to 60 inches; yellowish brown (10YR 5/6) very gravelly sand stratified with thin lenses of sand, dark yellowish brown (10YR 4/6) moist, common fine distinct brown (7.5YR 5/8) moist, mottles; single grain; loose, nonsticky and nonplastic; 45 percent gravel; moderately alkaline.

The depth to a seasonal high water table from March through August ranges from 0 to 2 feet. The A horizon has a slightly alkaline through strongly alkaline reaction. Electrical conductivity in this horizon ranges from 2.0 to 8.0 millimhos per centimeter. The Cg horizon commonly has a texture of loam or sandy clay loam, but a thin layer of very gravelly loam is present in some pedons. The electrical conductivity in this horizon is less than 8 millimhos per centimeter.

The 2C horizon commonly has a texture of extremely gravelly loamy sand, very gravelly sand, or very gravelly loamy sand. Thin layers with a texture of sand, loamy sand, or gravelly loamy sand are common in this horizon. The 2C horizon has a slightly alkaline or moderately alkaline reaction. It has hue of 7.5YR or 10YR. The The depth to the 2C horizon ranges from 23 to 38 inches.

Rentsac Series

The Rentsac series consists of shallow, well drained soils on cuesta dip slopes and structural benches. They formed in residuum and alluvium derived from sandstone. Slope ranges from 2 to 15 percent. Elevation is 7,200 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Rentsac channery sandy loam, in an area of Rentsac-Wycolo complex, 2 to 15 percent slopes, 220 feet east, 200 feet south of the northwest corner of sec. 26, T. 13 N., R. 76 W.

A—0 to 3 inches; yellowish brown (10YR 5/4) channery sandy loam, dark yellowish brown (10YR 3/4) moist; single grain; loose, nonsticky and nonplastic; many fine roots; 5 percent gravel and 20 percent channers; the surface is 20 percent covered with channers and a few flagstones; slightly alkaline; clear smooth boundary.

Bw—3 to 6 inches; yellowish brown (10YR 5/4) very channery sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few fine and medium roots; 10 percent gravel and 40 percent channers; slightly alkaline; clear smooth boundary.

C—6 to 14 inches; brown (7.5YR 5/4) extremely channery sandy loam, dark brown (7.5YR 3/4) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few fine roots; 10 percent gravel and 60 percent channers; neutral; abrupt smooth boundary.

R—14 inches; hard brown sandstone.

The surface is 20 to 50 percent covered with sandstone gravel, channers, or stones. The depth to bedrock ranges from 10 to 20 inches. The particle-size control section is 10 to 18 percent clay. Reaction is neutral or slightly alkaline throughout the profile. The Bw horizon has a texture of very channery sandy loam or very channery loam. The C horizon has a texture of extremely channery sandy loam or extremely channery loam.

These Rentsac soils are a taxadjunct to the Rentsac series because they are noneffeverscent throughout the profile. They are loamy-skeletal, mixed, nonacid, frigid Lithic Ustic Torriorthents.

Renvers Series

The Renvers series consists of very shallow, well drained soils on cuesta dip slopes. They formed in residuum and alluvium derived from sandstone. Slope ranges from 3 to 15 percent. Elevation is 7,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Renvers very stony loam, in an area of Renvers-Chalkhill complex, 1 to 15 percent slopes, 900 feet north, 500 feet east of the southwest corner of sec. 24, T. 27 N., R. 77 W.

A1—0 to 1 inch; pale brown (10YR 6/3) very stony loam, brown (10YR 4/3) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; 30 percent stones, 5 percent cobbles, and 10 percent gravel; the surface is 35 percent covered with stones and cobbles and 15 percent covered with gravel; neutral; abrupt smooth boundary.

AC—1 to 4 inches; brown (7.5YR 5/4) very stony fine sandy loam, brown (7.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine and very fine roots; 15 percent gravel, 5 percent cobbles, and 35 percent stones; neutral.

R—4 inches; hard sandstone.

The surface is 20 to 50 percent covered with sandstone gravel, channers, or stones. The depth to bedrock ranges from 4 to 10 inches. The particle-size control section is 8 to 18 percent clay and 35 to 50 percent rock fragments. Reaction is neutral or slightly alkaline throughout the profile.

Rimton Series

The Rimton series consists of moderately deep, well drained soils on north-facing mountain slopes and canyon sides. They formed in residuum and colluvium derived from interbedded sandstone and limestone. Slope ranges from 10 to 60 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Rimton very fine sandy loam, in an area of Rimton-Passcreek, cobbly subsoil-Miracle complex, 10 to 60 percent slopes, 1,700 feet east, 1,300 feet south of the northwest corner of sec. 16, T. 15 N., R. 72 W.

Oe—2 inches to 0; partially decomposed pine needles and forest litter.

A—0 to 4 inches; very dark gray (10YR 3/1) very fine sandy loam, black (10YR 2/1) moist; moderate medium granular structure; slightly hard; very friable, nonsticky and nonplastic; common fine and medium roots; neutral; clear wavy boundary.

E—4 to 9 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium platy structure parting to weak fine granular; slightly hard, very friable, nonsticky and nonplastic; common fine roots; neutral; clear irregular boundary.

E/B—9 to 15 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; interfingered with brown (7.5YR 4/4) sandy clay loam, dark brown (7.5YR 3/4) moist; strong coarse angular blocky structure; hard, friable, sticky and plastic; common fine roots; slightly alkaline; clear smooth boundary.

Bt1—15 to 24 inches; strong brown (7.5YR 4/6) sandy clay loam, dark brown (7.5YR 3/4) moist; strong coarse prismatic structure parting to strong coarse angular blocky; hard, firm, sticky and plastic; common fine roots; common prominent clay films on faces of peds; 10 percent cobbles; slightly alkaline; clear smooth boundary.

Bt2—24 to 32 inches; yellowish red (5YR 5/6) sandy clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; few faint clay films on faces of peds; 10 percent cobbles; slightly alkaline; clear smooth boundary.

Bk—32 to 39 inches; yellowish red (5YR 5/6) very cobbly fine sandy loam, reddish brown (5YR 4/4) moist; slightly hard, very friable, nonsticky and nonplastic; common fine roots; noneffervescent matrix, calcium carbonate as thin coatings on rock fragments; 10 percent gravel, 35 percent cobbles, and 5 percent small stones; slightly alkaline; clear smooth boundary.

Cr—39 inches; weakly consolidated, interbedded limestone and sandstone.

The depth to bedrock ranges from 20 to 40 inches. The A and Bt horizons have neutral or slightly alkaline reactions. The Bt horizon has a texture of sandy clay loam or cobbly sandy clay loam; it is 25 to 35 percent clay and 10 to 20 percent rock fragments. The Bk horizon has a texture of very cobbly fine sandy loam or very cobbly sandy clay loam; it is 40 to 60 percent rock fragments.

The fine earth of the Bk horizon is noneffervescent, but in some pedons thin coatings of calcium carbonate occur on the rock fragments. The rock fragments in the Bt and Bk horizons are mainly angular cobbles 3 to 8 inches in diameter.

Rock River Series

The Rock River series consists of deep, well drained soils on alluvial fans and terraces. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Rock River soil, in an area of Rock River sandy loam, 2 to 6 percent slopes, 250 feet west, 1,150 feet south of the northeast corner of sec. 19, T. 18 N., R. 73W.

A—0 to 3 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak coarse granular structure parting to moderate medium granular; soft, very friable, slightly sticky and nonplastic; many very fine and fine and common medium roots; slightly alkaline; abrupt smooth boundary.

Bt1—3 to 12 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure parting to strong medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; few fine and medium roots; common distinct clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—12 to 17 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few faint clay films on faces of peds; 5 percent cobbles; slightly alkaline; clear smooth boundary.

Bk—17 to 60 inches; brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; slightly effervescent, calcium carbonate is disseminated and also occurs as few fine seams; 5 percent gravel and cobbles; slightly alkaline.

The surface is 0 to 50 percent covered with gravel. The A and Bt horizons have neutral or slightly alkaline reactions. The Bt horizon has a texture of sandy clay loam or gravelly sandy clay loam; it is 20 to 30 percent clay and 35 to 55 percent fine or coarser sand. The Bt horizon has hue of 10YR or 7.5YR. The Bk horizon has a texture of fine sandy loam, sandy loam, or gravelly sandy clay loam. It has a slightly alkaline to strongly alkaline reaction. The Bk horizon has hue of 2.5Y or 10YR.

Rogert Series

The Rogert series consists of shallow, well drained soils on foothills and mountain slopes. They formed in residuum and colluvium derived from granite. Slope ranges from 5 to 99 percent. Elevation is 7,600 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Rogert gravelly sandy loam, in an area of Hapjack-Rogert-Amesmont complex, 3 to 25 percent slopes, 1,300 feet east, 1,300 feet south of the northwest corner of sec. 13, T. 15 N., R. 72 W.

A—0 to 3 inches; brown (7.5YR 4/4) gravelly sandy loam, dark brown (7.5YR 3/2) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and common medium roots; 25 percent gravel; the surface is 40 percent covered with gravel; neutral; abrupt smooth boundary.

AB—3 to 8 inches; brown (7.5YR 4/3) gravelly sandy loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure parting to moderate medium granular; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; 25 percent gravel; neutral; clear wavy boundary.

C—8 to 16 inches; brown (7.5YR 4/4) very gravelly sandy loam, dark brown (7.5YR 3/4) moist; single grain; loose, nonsticky and nonplastic; few medium roots; 60 percent gravel; neutral; abrupt wavy boundary.

R—16 inches; hard granite.

The surface is 20 to 70 percent covered with fine gravel. The depth to bedrock ranges from 10 to 20 inches. The mollic epipedon is 7 to 12 inches thick. The A horizon has hue of 10YR or 7.5YR. The C horizon is 45 to 60 percent gravel. It has a neutral or slightly alkaline reaction.

Rohonda Series

The Rohonda series consists of moderately deep, well drained soils on strath terraces, structural benches, hillslopes and foot slopes of ridges, and in swales. They formed in residuum and alluvium derived from shale, sandstone, and limestone. Slope ranges from 3 to 15 percent. Elevation is 6,000 to 9,000 feet, average annual precipitation is 10 to 19 inches, and average annual air temperature is 38 to 45 degrees F. Frost-free period is less than 60 to 110 days.

Typical pedon of Rohonda fine sandy loam, in an area of Rohonda-Tieside complex, 3 to 10 percent slopes, 50 feet east, 150 feet south of the northwest corner of sec. 22, T. 13 N., R. 73 W.

A—0 to 3 inches; reddish brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; abrupt smooth boundary.

AB—3 to 6 inches; reddish brown (5YR 4/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and medium roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; abrupt smooth boundary.

Bt—6 to 16 inches; reddish brown (5YR 5/4) fine sandy loam, dark reddish brown (5YR 3/4) moist; moderate coarse prismatic structure parting to strong coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few medium roots; many distinct clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated and has a 4 percent calcium carbonate equivalent by calcimeter method; moderately alkaline; clear wavy boundary.

Btk—16 to 21 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure parting to moderate medium granular; slightly hard, very friable, slightly sticky and nonplastic; few faint clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated and has a 6 percent calcium carbonate equivalent by calcimeter method; 10 percent fine gravel; moderately alkaline; gradual wavy boundary.

Bk—21 to 38 inches; light red (2.5YR 6/6) fine sandy loam, red (2.5YR 5/6) moist; massive; soft, very friable, slightly sticky and nonplastic; violently effervescent, calcium carbonate is disseminated and also occurs as thin pendants on undersides of larger gravel, 12 percent calcium carbonate equivalent by calcimeter method; 10 percent fine and medium gravel; moderately alkaline; clear smooth boundary.

Cr—38 inches; weakly consolidated sandstone.

The depth to bedrock ranges from 20 to 40 inches. The A and Bt horizons have slightly alkaline or moderately alkaline reactions. The Bt horizon has a texture of sandy loam, fine sandy loam, or very fine sandy loam. The Bk horizon has a texture of fine sandy loam or sandy loam; it is 5 to 15 percent gravel. Calcium carbonate equivalent in the Bk horizon ranges from 5 to 15 percent. Hue in the Bk horizon is 2.5YR to 7.5YR.

Ryan Park Series

The Ryan Park series consists of very deep, well drained soils on hills, ridges, alluvial fans, and terraces. They formed in alluvium. Slope ranges from 1 to 15 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Ryan Park fine sandy loam, in an area of Fiveoh-Fiveoh, cobbly substratum-Ryan Park complex, 1 to 8 percent slopes, 1,500 feet north, 350 feet east of the southwest corner of sec. 25, T. 16 N., R. 73 W.

A—0 to 3 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and common medium roots; slightly alkaline; abrupt smooth boundary.

Bt—3 to 11 inches; brown (7.5YR 4/4) fine sandy loam, dark brown (7.5YR 3/4) moist; strong coarse prismatic structure parting to strong coarse subangular blocky; hard, friable, slightly sticky and slightly plastic; common fine and medium roots; common faint and distinct clay films on faces of peds; 5 percent gravel; slightly alkaline; clear smooth boundary.

Bk1—11 to 18 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 3/4) moist; moderate coarse subangular block structure; hard, friable, slightly sticky and slightly plastic; few medium roots; strongly effervescent, calcium carbonate is disseminated; 5 percent coarse gravel; moderately alkaline; gradual wavy boundary.

Bk2—18 to 38 inches; brown (7.5YR 5/4) gravelly fine sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard, very friable, sticky and nonplastic; few medium roots; violently effervescent, calcium carbonate is disseminated and also occurs as pendants on undersides of rock fragments; 15 percent coarse gravel and 10 percent cobbles; moderately alkaline; gradual wavy boundary.

Bk3—38 to 60 inches; light brown (7.5YR 6/4) gravelly sandy loam, brown (7.5YR 5/4) moist; massive; slightly hard, very friable, sticky and nonplastic; few fine roots; violently effervescent, calcium carbonate is disseminated and also occurs as pendants on undersides of rock fragments; 15 percent gravel and 10 percent cobbles; moderately alkaline.

The A horizon has a neutral or slightly alkaline reaction. The Bt and Bk horizons have hue of 7.5YR or 10YR. The Bt horizon is 10 to 17 percent clay and 0 to 5 percent gravel. Reaction in this horizon is slightly alkaline or moderately alkaline. The Bk horizon has a texture of gravelly fine sandy loam, gravelly sandy loam, or fine sandy loam; it is 0 to 15 percent gravel and 0 to 10 percent cobbles. The Bk horizon has a moderately alkaline or strongly alkaline reaction.

Ryark Series

The Ryark series consists of very deep, well drained soils on alluvial fans. They formed in eolian deposits derived from various sources. Slope ranges from 1 to 6 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of the Ryark soil, in an area of Ryark loamy sand, 1 to 6 percent slopes, 1,300 feet east, 1,800 feet north of the southwest corner of sec. 6, T. 15 N., R. 72 W.

A—0 to 3 inches; brown (10YR 5/3) loamy sand, dark brown (10YR 3/3) moist; single grain; loose, nonsticky and nonplastic; many very fine, fine, and common medium roots; slightly alkaline; abrupt smooth boundary.

BA—3 to 6 inches; yellowish brown (10YR 5/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak coarse granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and common medium roots; slightly alkaline; clear smooth boundary.

Bt—6 to 20 inches; dark yellowish brown (10YR 4/4) sandy loam, dark yellowish brown (10YR 3/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; common faint clay films on faces of peds and clay bridges between sand grains; slightly alkaline; clear wavy boundary.

BC—20 to 36 inches; brown (7.5YR 4/4) sandy loam, dark brown (7.5YR 3/4) moist; weak coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine and medium roots; slightly alkaline; clear wavy boundary.

C1—36 to 60 inches; light brown (7.5YR 6/4) loamy sand, dark brown (7.5YR 4/4) moist; single grain; loose, nonsticky and nonplastic; slightly alkaline.

The A and Bt horizons have neutral or slightly alkaline reactions. The Bt horizon is 10 to 18 percent clay. The C horizon has hue of 7.5YR or 10YR.

Satanka Series

The Satanka series consists of moderately deep, well drained soils on ridges. They formed in alluvium and residuum derived from sedimentary rock. Slope ranges from 5 to 20 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Satanka fine sandy loam, in an area of Blackhall-Satanka-Rock outcrop complex, 5 to 20 percent slopes, 2,400 feet west, 50 feet north of the southeast corner of sec. 36, T. 16 N., R. 74 W.

A—0 to 4 inches; pale brown (10YR 6/3) fine sandy loam, dark brown (10YR 4/3) moist; moderate fine granular structure; weak fine platy in upper inch; soft, very friable, nonsticky and nonplastic; slightly alkaline; clear smooth boundary.

Bt—4 to 9 inches; brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, slightly sticky and slightly plastic; many faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bk1—9 to 13 inches; grayish brown (2.5Y 5/2) sandy clay loam, olive brown (2.5Y 4/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; hard, friable, sticky and plastic; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine and medium soft masses, threads, and seams; moderately alkaline; clear wavy boundary.

Bk2—13 to 35 inches; light gray (2.5Y 7/2) sandy clay loam, light yellowish brown (2.5Y 6/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine and medium soft masses, threads, and seams; numerous partially weathered sandstone fragments that break down when moistened and rubbed; strongly alkaline; diffuse wavy boundary.

Cr—35 inches; weakly consolidated sandstone.

The particle-size control section averages 20 to 30 percent clay and 45 to 55 percent fine or coarser sand. The A and Bt horizons have aslightly alkaline or moderately alkaline reactions. The Bk horizon has a texture of sandy loam or sandy clay loam. It has a moderately alkaline or strongly alkaline reaction.

Shirleybasin Series

The Shirleybasin series consists of very deep, well drained soils on the foot slopes of pediment breaks and

pediment summits. They formed in alluvium and residuum derived dominantly from tuffaceous sedimentary rocks. Slope ranges from 0 to 8 percent. Elevation is 7,000 to 7,500 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Shirleybasin loam, in an area of Shirleybasin-Twocabin-Lahtida complex, 0 to 15 percent slopes, 2,250 feet west, 2,250 feet south of the northeast corner of sec. 27, T. 27 N., R. 76 W.

A—0 to 2 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate fine granular structure; soft, very friable, sticky and plastic; many very fine and fine and few medium and coarse roots; common very fine pores; neutral; abrupt wavy boundary.

Bt1—2 to 8 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, sticky and plastic; many very fine and fine and common medium roots; many very fine and common fine pores; many faint clay films on faces of peds; slightly alkaline; clear wavy boundary.

Bt2—8 to 27 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, very firm, sticky and plastic; common very fine and fine and few medium roots; many faint clay films on faces of peds; slightly alkaline; abrupt wavy boundary.

Bk1—27 to 52 inches; white (2.5Y 8/2) clay loam, white (2.5Y 8/2) moist; common coarse distinct olive brown (2.5YR 4/6) and yellowish brown (10YR 5/8) lithochromic mottles; massive; hard, firm, sticky and plastic; few fine and very fine roots; common very fine pores; strongly effervescent, calcium carbonate is disseminated; 5 percent fine gravel; strongly alkaline; clear wavy boundary.

Bk2—52 to 60 inches; light gray (2.5Y 7/2) gravelly sandy clay loam, light brownish gray (2.5Y 6/2) moist; massive; slightly hard, firm, sticky and plastic; strongly effervescent, calcium carbonate is disseminated; 25 percent fine gravel; moderately alkaline.

The Bt horizon has a dominant texture of clay loam or clay, but a thin layer of sandy clay loam is present in some pedons. This horizon is 0 to 15 percent rock fragments. Although some thin individual subhorizons are 30 to 35 percent clay, the Bt horizon averages 35 to 45 percent clay. Reaction in the Bt horizon is neutral to moderately alkaline. The Bk horizon has a texture of loam, gravelly sandy clay loam, sandy clay loam, or clay loam. It has a moderately alkaline or strongly alkaline reaction.

Silas Series

The Silas series consists of very deep, somewhat poorly drained soils on outwash terraces and in mountain valleys. They formed in alluvium derived dominantly from granite. Slope ranges from 1 to 6 percent. Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Silas loam, gravelly substratum, in an area of Silas, gravelly substratum-Vensora loams, 0 to 6 percent slopes, 150 feet north, 70 feet west of the southeast corner of sec. 34, T. 18 N., R. 72 W.

A—0 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and medium roots; neutral; clear smooth boundary.

A/C—8 to 22 inches; 75 percent dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; 25 percent very dark grayish brown (10YR 3/2) very fine sandy loam, black (10YR 2/1) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; neutral; gradual irregular boundary.

C1—22 to 42 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, slightly sticky and plastic; 20 percent fine gravel; slightly alkaline; gradual wavy boundary.

2C2—42 to 60 inches; yellowish brown (10YR 5/4) very gravelly sandy loam stratified with layers of gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; common medium faint strong brown (7.5YR 5/8) mottles; single grain; loose, nonsticky and nonplastic; 50 percent fine gravel; slightly alkaline.

The depth to a seasonal high water table ranges from 2.5 to 4.5 feet from April through July. The mollic epipedon is 16 to 22 inches thick. The particle-size control section averages 20 to 30 percent clay and 5 to 20 percent rock fragments. Reaction is neutral or slightly alkaline throughout the profile. The C horizon has hue of 10YR or 2.5Y. It has a texture of gravelly sandy clay loam, gravelly clay loam, sandy clay loam, loam, or clay loam. The 2C horizon is absent in some pedons.

Spinekop Series

The Spinekop series consists of very deep, well drained soils on saddles of mountains. They formed in

alluvium from various sources. Slope ranges from 0 to 10 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Spinekop sandy loam, in an area of Cathedral-Spinekop-Rock outcrop complex, 0 to 40 percent slopes, 1,500 feet east, 550 feet south of the northwest corner of sec. 27, T. 22 N., R. 71 W.

A—0 to 2 inches; grayish brown (10YR 5/2) sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; moderately alkaline; clear smooth boundary.

Bw1—2 to 9 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate fine prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and medium roots; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; gradual wavy boundary.

Bw2—9 to 31 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 4/3) moist; weak medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; strongly effervescent, calcium carbonate is disseminated; strongly alkaline; gradual wavy boundary.

2Bk—31 to 60 inches; brown (10YR 5/3) very fine sandy loam, dark brown (10YR 4/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine threads; strongly alkaline.

The particle-size control section averages 18 to 30 percent clay and 15 to 35 percent or coarser fine sand. The A horizon has a neutral to moderately alkaline reaction. The Bw and Bk horizons have amoderately alkaline or strongly alkaline reactions. The Bw horizon has a texture of loam, clay loam, or silty clay loam. The 2Bk horizon has a texture of very fine sandy loam or loam.

Stunner Series

The Stunner series consists of very deep, well drained soils on strath terraces, fan terraces and in valleys. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Stunner sandy loam, in an area of Stunner-Borollic Camborthids complex, 2 to 5 percent slopes, 1,425 feet west, 25 feet south of the northeast corner of sec. 26, T. 20 N., R. 74 W.

A—0 to 3 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; slightly alkaline; abrupt smooth boundary.

Bt1—3 to 6 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bt2—6 to 13 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; strong medium prismatic structure; hard, friable, slightly sticky and slightly plastic; many distinct clay films on faces of peds; slightly alkaline; abrupt smooth boundary.

Btk—13 to 25 inches; light gray (10YR 7/2) loam, grayish brown (2.5Y 5/2) moist; moderate medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; few faint clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; gradual smooth boundary.

Bk—25 to 60 inches; pale brown (10YR 6/3) loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; strongly effervescent, calcium carbonate is disseminated; a 1-inch-thick layer of gravelly loam occurs at a depth of 24 inches; strongly alkaline.

The A horizon has a neutral or slightly alkaline reaction. The A and Bt horizons have hue of 10YR or 7.5YR. The Bt horizon has a texture of loam or clay loam; it is 22 to 34 percent clay and 20 to 35 percent fine or coarse sand. The Bk horizon has a texture of sandy loam, fine sandy loam, loam, or sandy clay loam. It has a moderately alkaline or strongly alkaline reaction. The upper part of the Bk horizon has a calcium carbonate equivalent of 15 to 25 percent.

Stylite Series

The Stylite series consists of very deep, well drained soils on hillslopes. They formed in alluvium and residuum derived from gypsiferous sedimentary rock. Slope ranges from 1 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Stylite fine sandy loam, in an area of Luvar-Stylite-Diamonkit complex, 1 to 8 percent slopes, 150 feet north and 2,300 feet west of the southeast corner of sec. 2, T. 15 N., R. 74 W.

A—0 to 2 inches; yellowish brown (10YR 5/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, nonsticky and nonplastic; many fine roots; few very fine discontinuous pores; slightly alkaline; abrupt smooth boundary.

BA—2 to 4 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine roots; few very fine discontinuous pores; slightly effervescent, calcium carbonate is disseminated; slightly alkaline; clear smooth boundary.

Bt—4 to 14 inches; yellowish brown (10YR 5/4) loam, dark yellowish brown (10YR 4/4) moist; moderate medium columnar structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; few fine and very fine discontinuous pores; common distinct clay films on faces of peds; slightly alkaline; gradual smooth boundary.

Btk—14 to 21 inches; very pale brown (10YR 7/3) clay loam, yellowish brown (10YR 5/4) moist; weak medium columnar structure parting to weak medium subangular blocky; slightly hard, friable, sticky and slightly plastic; common fine roots; few very fine discontinuous pores; few faint clay films on faces of peds; violently effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses, 20 percent calcium carbonate equivalent by calcimeter; moderately alkaline; gradual smooth boundary.

Bk—21 to 30 inches; very pale brown (10YR 7/3) clay loam, light yellowish brown (10YR 6/4) moist; massive; slightly hard, friable, sticky and slightly plastic; few very fine roots; few very fine discontinuous pores; violently effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses, 10 percent calcium carbonate equivalent; moderately alkaline; gradual wavy boundary.

By1—30 to 40 inches; pale brown (10YR 6/3) loam; yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, sticky and slightly plastic; common very fine discontinuous pores; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses; gypsum as many (30 percent) fine and few (2 percent) medium soft masses; moderately alkaline; gradual wavy boundary.

By2—40 to 60 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, sticky and plastic; common very fine discontinuous pores; slightly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses; gypsum as many (30 percent) fine and common (5 percent) medium soft masses; moderately alkaline.

The A, Bt, and By horizons have slightly alkaline or moderately alkaline reactions. The Bk horizon has a moderately alkaline or strongly alkaline reaction. Calcium carbonate equivalent in the Bk horizon is 10 to 25 percent. The By horizon is 15 to 40 percent gypsum. The electrical conductivity in the By horizon is 4 to 8 millimhos per centimeter. The Bt, Bk and By horizons have textures of loam or clay loam.

Teeler Series

The Teeler series consists of very deep, well drained soils on mountain slopes and alluvial fans. They formed in alluvium and colluvium derived from schist and granite. Slope ranges from 5 to 40 percent. Elevation is 7,800 to 8,900 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Teeler very gravelly sandy loam, in an area of Teeler very gravelly sandy loam, 5 to 40 percent slopes, 325 feet west, 550 feet north of the southeast corner of sec. 15, T. 13 N., R. 77 W.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) very gravelly sandy loam, black (10YR 2/1) moist; single grain; loose, nonsticky and nonplastic; many fine roots; 35 percent gravel; the surface is 50 percent covered with cobbles and gravel; slightly alkaline; abrupt smooth boundary.

AB—2 to 6 inches; very dark grayish brown (10YR 3/2) very gravelly sandy loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; 35 percent gravel; neutral; clear smooth boundary.

Bt—6 to 14 inches; dark brown (10YR 3/3) very gravelly sandy clay loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; common faint clay films on faces of peds; 35 percent gravel and 5 percent cobbles; slightly alkaline; gradual smooth boundary.

Btk—14 to 26 inches; light olive brown (2.5Y 5/4) very gravelly sandy loam, very dark grayish brown (2.5Y 3/2) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; few faint clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated and also occurs as common thin coatings and pendants on rock fragments; 30 percent gravel and 15 percent cobbles; moderately alkaline; clear smooth boundary.

Bk—26 to 60 inches; light brownish gray (2.5Y 6/2) very cobbly sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few fine roots; strongly effervescent, calcium carbonate is disseminated and also occurs as moderately thick pendants on rock fragments, 24 percent calcium carbonate equivalent by calcimeter method; 30 percent gravel and 20 percent cobbles; moderately alkaline.

The A horizon has a neutral or slightly alkaline reaction. The Bk horizon has a moderately alkaline or strongly alkaline reaction. The Bk horizon has a texture of very cobbly sandy loam or very gravelly sandy loam. Calcium carbonate equivalent in this horizon is 15 to 30 percent.

This Teeler soil is outside the characteristics of the Teeler series because it has hue of 10YR or 2.5YR in the Bt and Bk horizons.

Telecan Series

The Telecan series consists of very deep, well drained soils on valley bottoms. They formed in alluvium derived dominantly from interbedded sandstone and limestone. Slope ranges from 3 to 6 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Telecan fine sandy loam, in an area of Bruja-Canwall-Telecan association, 3 to 60 percent slopes, 1,400 feet east, 2,200 feet north of the southwest corner of sec. 6, T. 14 N., R. 72 W.

A—0 to 4 inches; brown (7.5YR 4/4) fine sandy loam, dark brown (7.5YR 3/2) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; moderately alkaline; clear smooth boundary.

Bw1—4 to 16 inches; dark brown (7.5YR 3/4) fine sandy loam, dark brown (7.5YR 3/3) moist; moderately coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; moderately alkaline; clear smooth boundary.

Bw2—16 to 27 inches; dark yellowish brown (10YR 3/4) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; very few fine roots; slightly effervescent, calcium carbonate is disseminated; moderately alkaline; gradual smooth boundary.

Bk1—27 to 41 inches; dark brown (7.5YR 3/4) very fine sandy loam, dark brown (7.5YR 3/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; very few fine roots; violently effervescent, calcium carbonate is disseminated; moderately alkaline; gradual smooth boundary.

Bk2—41 to 60 inches; brown (7.5YR 4/4) fine sandy loam, dark brown (7.5YR 3/4) moist; massive; soft, very friable, slightly sticky and nonplastic; very few fine roots; violently effervescent, calcium carbonate is disseminated; moderately alkaline.

The hue is 7.5YR or 10YR throughout the profile. The A horizon has a slightly alkaline or moderately alkaline reaction. The Bw and Bk horizons have textures of fine sandy loam or very fine sandy loam.

Thermopolis Series

The Thermopolis series consists of shallow, well drained soils on cuesta escarpments. They formed in residuum and colluvium derived from siltstone and shale. Slope ranges from 20 to 50 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Thermopolis fine sandy loam, in an area of Wycolo-Thermopolis-Rock outcrop complex, 10 to 50 percent slopes, 300 feet north, 500 feet east of the southwest corner of sec. 3, T. 16 N., R. 73 W.

A—0 to 2 inches; reddish brown (5YR 5/4) fine sandy loam, reddish brown (5YR 4/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; strongly effervescent, calcium carbonate is disseminated; 10 percent gravel; the surface is 25 percent covered with gravel; moderately alkaline; abrupt smooth boundary.

Bk1—2 to 5 inches; yellowish red (5YR 5/6) loam, red (2.5YR 4/6) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; violently effervescent, calcium carbonate as common fine seams and small masses; 10 percent soft weathered shale fragments less than 1/4 inch in diameter that break down when wetted; strongly alkaline; abrupt irregular boundary.

Bk2—5 to 14 inches; red (2.5YR 5/6) silt loam, red (2.5YR 4/6) moist; massive; slightly hard, friable, very sticky and plastic; very few fine and medium roots; violently effervescent, calcium carbonate as common fine seams and small masses; 30 percent soft weathered shale fragment less than 1/4 inch in diameter that break down when wetted; strongly alkaline; abrupt irregular boundary.

Cr—14 inches; weakly consolidated red shale.

The depth to bedrock is 10 to 20 inches. The Bk horizon has a texture of loam or silt loam. It has a moderately alkaline or strongly alkaline reaction.

Thiel Series

The Thiel series consists of very deep, well drained soils on fans, terraces, and hills. They formed in alluvium. Slope ranges from 5 to 20 percent. Elevation is 7,800 to 8,200 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Thiel gravelly sandy loam, in an area of Thiel-Lymanson-Leavitt complex, 5 to 20 percent slopes, 2,250 feet east, 2,270 feet south of the northwest corner of sec. 14, T. 12 N., R. 77 W.

A—0 to 3 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; slightly effervescent, calcium carbonate is disseminated; 20 percent gravel; the surface is 25 percent covered with gravel; slightly alkaline; clear smooth boundary.

Bt1—3 to 8 inches; brown (10YR 4/3) very gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and medium roots; few faint clay films on faces of peds and as bridging between mineral grains; slightly effervescent, calcium carbonate is disseminated; 35 percent gravel; slightly alkaline; clear smooth boundary.

Bt2—8 to 12 inches; dark yellowish brown (10YR 4/4) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; weak medium columnar structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common distinct clay films on faces of peds; slightly effervescent, calcium carbonate is disseminated and has a 3 percent calcium carbonate equivalent; 30 percent gravel and 10 percent cobbles; moderately alkaline; gradual smooth boundary.

Bk1—12 to 19 inches; very pale brown (10YR 7/3) very gravelly sandy loam, light yellowish brown (10YR 6/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; very few fine roots; violently effervescent, calcium carbonate is disseminated and also occurs as common medium soft masses and as thin coatings on undersides of gravel, 45 percent calcium carbonate equivalent; 50 percent gravel; moderately alkaline; gradual wavy boundary.

2Bk2—19 to 27 inches; very pale brown (10YR 7/4) very gravelly loamy sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard, loose, nonsticky and nonplastic; very few fine roots; violently effervescent, calcium carbonate is disseminated and also occurs as thick pendants on undersides of gravel, 30 percent calcium carbonate equivalent; 60 percent gravel; moderately alkaline; gradual wavy boundary.

2Bk3—27 to 35 inches; very pale brown (10YR 7/3) extremely gravelly loamy sand, very pale brown (10YR 7/3) moist; massive; very hard, extremely firm, nonsticky and nonplastic; violently effervescent, calcium carbonate cementing gravel and sand grains, 45 percent calcium carbonate equivalent; 70 percent gravel; strongly alkaline; gradual wavy boundary.

2Bk4—35 to 60 inches; very pale brown (10YR 7/4) extremely gravelly loamy sand, light yellowish brown (10YR 6/4) moist; massive; slightly hard, loose, nonsticky and nonplastic; strongly effervescent, calcium carbonate as moderately thick pendants on undersides of gravel; 70 percent gravel; moderately alkaline.

The surface is 25 to 40 percent covered with gravel and 0 to 5 percent covered with cobbles. The Bt horizon has a slightly alkaline or moderately alkaline reaction. The Bk and 2Bk horizons have amoderately alkaline or strongly alkaline reactions. Calcium carbonate equivalent in the Bk and 2Bk horizons is 25 to 45 percent. The 2Bk horizon has a texture of very gravelly loamy sand or extremely gravelly loamy sand.

Tieside Series

The Tieside series consists of shallow, well drained soils on cuesta dip slopes, hillslopes, structural benches, and strath terraces. They formed in residuum derived from interbedded limestone, sandstone, and shale. Slope ranges from 3 to 10 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Tieside sandy loam, in an area of Tieside-Pilotpeak-Rock outcrop complex, 3 to 10 percent slopes, 500 feet west, 80 feet south of the northeast corner of sec. 35, T. 13 N., R. 73 W.

A—0 to 4 inches; yellowish red (5YR 4/6) sandy loam, dark reddish brown (5YR 3/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; strongly effervescent, calcium carbonate is disseminated; moderately alkaline; clear smooth boundary.

Bk1—4 to 13 inches; yellowish red (5YR 4/6) sandy loam, dark reddish brown (5YR 3/4) moist; massive; soft, very friable, slightly sticky and nonplastic; few very

fine and fine and common medium roots; strongly effervescent; calcium carbonate is disseminated and also occurs as few thin pendants on undersides of gravel; 5 percent gravel; moderately alkaline; clear wavy boundary.

Bk2—13 to 19 inches; reddish brown (5YR 5/4) sandy loam, reddish brown (5YR 4/4) moist; massive; slightly hard, very friable, sticky and slightly plastic; very few fine and medium roots; violently effervescent, calcium carbonate as few fine soft masses and common moderately thick pendants on undersides of gravel; 10 percent gravel; moderately alkaline; gradual wavy boundary.

Cr—19 inches; weakly consolidated, interbedded limestone, sandstone, and shale.

The depth to bedrock ranges from 10 to 20 inches. The A horizon has a slightly alkaline or moderately alkaline reaction. The calcium carbonate equivalent in the Bk1 horizon is 20 to 30 percent; in the Bk2 it is 30 to 50 percent. The Bk1 horizon has a texture of sandy loam or fine sandy loam. The Bk2 horizon has a texture of coarse sandy loam, sandy loam, or fine sandy loam. The Bk horizons are 5 to 15 percent rock fragments.

Tismid Series

The Tismid series consists of very deep, well drained soils on fan terraces, stream terraces, and dip slopes, as well as in drainageways and areas adjacent to playas and intermittent lakes. They formed in alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,800 to 7,500 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Tismid sandy loam, in an area of Kiltabar-Tismid complex, 0 to 3 percent slopes, 1,500 feet west, 350 feet south of the northeast corner of sec. 26, T. 20 N., R. 75 W.

A—0 to 4 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft; loose, nonsticky and nonplastic; many fine and common medium roots; common very fine continuous pores; slightly alkaline; abrupt smooth boundary.

Bt—4 to 7 inches; pale brown (10YR 6/3) sandy clay loam, brown (10YR 4/3) moist; strong coarse prismatic structure parting to strong coarse subangular blocky; very hard, friable, sticky and plastic; many fine and common medium roots; common very fine and few fine continuous pores; few distinct clay films on faces of peds; slightly alkaline; clear smooth boundary.

Btn—7 to 20 inches; light yellowish brown (10YR 6/4) clay loam, brown (10YR 4/3) moist; strong coarse prismatic structure parting to strong coarse and medium subangular blocky; very hard, friable, sticky and plastic; many fine and common medium roots; common very fine and few fine continuous pores; many prominent clay films on faces of peds; very strongly alkaline; clear wavy boundary.

Btkn—20 to 26 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure; very hard, friable, slightly sticky and slightly plastic; few fine and medium roots; common very fine and few fine continuous pores; few distinct clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses, 10 percent calcium carbonate equivalent by calcimeter method; few fine soft masses of gypsum and few fine soft masses of more soluble salts; strongly alkaline; gradual wavy boundary.

Bkz1—26 to 36 inches; light yellowish brown (10YR 6/4) loam, yellowish brown (10YR 5/4) moist; massive; very hard, friable, slightly sticky and slightly plastic; few fine roots; common very fine and few fine continuous pores; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses, 10 percent calcium carbonate equivalent by calcimeter methods; few fine soft masses of gypsum and common fine soft masses of more soluble salts; electrical conductivity of 9.5 millimhos per centimeter; moderately alkaline; gradual wavy boundary.

Bkz2—36 to 60 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; massive; very hard, friable, slightly sticky and slightly plastic; few fine roots; common very fine and few fine continuous pores; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses, 7 percent calcium carbonate equivalent by calcimeter method; few fine soft masses of gypsum and common fine soft masses of more soluble salts; electrical conductivity of 8.8 millimhos per centimeter; 10 percent gravel; moderately alkaline.

The Bt and Btn horizons are 20 to 35 percent clay. They have a texture of sandy clay loam or clay loam. The Btn horizon has hue of 5YR through 10YR. The Bt horizon has a slightly alkaline or moderately alkaline reaction. Reaction is strongly alkaline or very strongly alkaline in the Btn horizon. The Bkz horizon has a moderately alkaline to very strongly alkaline reaction. The Bkyz horizon has a texture of loam or sandy clay loam.

Tisworth Series

The Tisworth series consists of very deep, well drained soils on fan terraces and stream terraces. They formed in

alluvium. Slope ranges from 0 to 8 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Tisworth sandy clay loam, in an area of Tisworth-Gerdrum Family complex, 0 to 6 percent slopes, 800 feet west, 3,000 feet south of the northeast corner of sec. 23, T. 19 N., R. 75 W.

A—0 to 2 inches; light yellowish brown (10YR 6/4) sandy clay loam, yellowish brown (10YR 5/4) moist; moderate very fine and fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, and few medium and coarse roots; common very fine and few fine continuous pores; strongly effervescent, calcium carbonate is disseminated; strongly alkaline; abrupt smooth boundary.

Btn—2 to 13 inches; yellowish brown (10YR 5/4) clay loam, brown (10YR 4/3) moist; strong very coarse prismatic structure parting to strong medium and coarse subangular blocky; very hard, firm, sticky and plastic; common very fine, fine, and few medium roots; common very fine and few fine continuous pores; common prominent clay films on faces of peds; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses; few fine soft masses of gypsum; very strongly alkaline; clear smooth boundary.

Bkn—13 to 38 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; massive; very hard, firm, sticky and plastic; common very fine, fine, and few medium and coarse roots to 20 inches, few very fine, fine, and medium roots below 20 inches; common very fine and few fine continuous pores; strongly effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses; few fine soft masses of gypsum; very strongly alkaline; clear wavy boundary.

Bky—38 to 60 inches; light yellowish brown (10YR 6/4) clay loam, yellowish brown (10YR 5/4) moist; massive; very hard, firm, sticky and plastic; few very fine, fine, and medium roots; common very fine and few fine continuous pores; strongly effervescent, calcium carbonate is disseminated and also occurs as many fine and medium soft masses; many medium and fine soft masses of gypsum; strongly alkaline.

The A horizon is 0 to 10 percent gravel. It has a slightly alkaline to strongly alkaline reaction. The Btn horizon has a texture of clay loam or sandy clay loam; it is 25 to 35 percent clay and less than 10 percent gravel. The Btn horizon has a strongly alkaline or very strongly alkaline reaction. The Bkn and Bky horizons have textures of loam, clay loam, or sandy clay loam and are 0 to 15 percent gravel. The Bkn and Bky horizons have moderately alkaline to very strongly alkaline reactions.

Tule Series

The Tule series consist of very shallow or shallow and well drained soils on ridges and pediments. They formed in alluvium and residuum derived dominantly from tuffaceous rock. Slope ranges from 0 to 15 percent. Elevation is 6,600 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Tule loam, in an area of Tule-Chalkville loams, 0 to 15 percent slopes, 1,800 feet east and 1,200 feet north of the southwest corner of sec. 34, T. 28 N., R. 77 W.

A—0 to 3 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine and very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 5 percent gravel; slightly alkaline; clear wavy boundary.

C1—3 to 12 inches; yellowish brown (10YR 5/4) loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; 5 percent gravel; moderately alkaline; clear wavy boundary.

2C2—12 to 15 inches; yellowish brown (10YR 5/4) extremely gravelly loam, brown (10YR 4/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; slightly effervescent, calcium carbonate pendants on the undersides of the gravel; 65 percent gravel; moderately alkaline; clear wavy boundary.

R—15 inches; hard white tuff.

The depth to bedrock ranges from 4 to 20 inches. The A horizon has a neutral or slightly alkaline reaction. Reaction in the C horizon is neutral to moderately alkaline. The C horizon has a fine-earth texture of loam or sandy clay loam. The content of rock fragments ranges from 5 to 65 percent in the individual subhorizons of the C horizon, but the particle-size control section averages 35 to 45 percent rock fragments.

Twocabin Series

The Twocabin series consists of very deep, well drained soils on the crests of ridges, breaks, and knobs of dissected pediments to the Laramie Range. They formed in alluvium overlying residuum derived from interbedded tuff, shale, and claystone. Slope ranges from 6 to 15 percent. Elevation is 7,000 to 7,500 feet, average

annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Twocabin gravelly loam, in an area of Shirleybasin-Twocabin-Lahtida complex, 0 to 15 percent slopes, 1,900 feet south, 2,000 feet west of the northeast corner of sec. 4, T. 27 N, R. 76 W.

A—0 to 4 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine roots; 20 percent medium and coarse gravel; neutral; abrupt smooth boundary.

Bt—4 to 11 inches; brown (7.5YR 5/4) very gravelly sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to moderate medium angular blocky; slightly hard, friable, sticky and plastic; few fine roots; many distinct clay films on faces of peds; 40 percent medium and coarse gravel; neutral; clear wavy boundary.

Btk—11 to 20 inches; very pale brown (10YR 7/3) very gravelly loam, light yellowish brown (10YR 6/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; common faint clay films on faces of peds; 40 percent fine gravel; violently effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses; moderately alkaline; clear smooth boundary.

2Bk1—20 to 27 inches; white (10YR 8/2) loam, very pale brown (10YR 7/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; violently effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses; less than 5 percent fine gravel; moderately alkaline; gradual smooth boundary.

2Bk2—27 to 60 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; violently effervescent, calcium carbonate is disseminated and also occurs as common fine masses and filaments; less than five percentt fine and medium gravel; moderately alkaline.

The surface is 10 to 50 percent covered with cobbles and gravel. The A horizon is 20 to 30 percent gravel and 0 to 10 percent cobbles. It has a neutral or slightly alkaline reaction. Hue of the A and Bt horizons is 10YR or 7.5YR. The Bt and Btk horizons have fine-earth textures of sandy clay loam or clay loam and commonly are very gravelly. In some pedons however, they are very cobbly. The Bt and Btk horizons are 18 to 35 percent clay and 35 to 50 percent rock fragments. The rock fragments consist of 25 to 40 percent gravel and 0 to 35 percent cobbles. Reaction in the Bt horizon is neutral through moderately alkaline. The calcium carbonate equivalent in the Btk horizon is 10 to 25 percent.

The 2Bk horizon has hue of 10YR or 2.5Y. It has a texture of loam, clay loam, or sandy clay loam. The reaction in this horizon is moderately alkaline or strongly alkaline. Calcium carbonate equivalent in this horizon is 15 to 35 percent.

Tyzak Series

The Tyzak series consists of very shallow or shallow and well drained soils on mountain hogback slopes and canyon sides. They formed in residuum and colluvium derived from limestone. Slope ranges from 30 to 60 percent. Elevation is 6,500 to 7,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Tyzak cobbly very fine sandy loam, in an area of Tyzak-Rock outcrop complex, 30 to 60 percent slopes, 1,060 feet east, 1,320 feet north of the southwest corner of sec. 1, T. 16 N, R. 73 W.

A—0 to 4 inches; brown (10YR 4/3) cobbly very fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine granular structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine, fine, and few medium roots; slightly effervescent, calcium carbonate is disseminated and also occurs as thin pendants on undersides of rock fragments; 15 percent gravel and 15 percent cobbles; the surface is 60 percent covered with cobbles; moderately alkaline; clear smooth boundary.

Bk—4 to 13 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, nonsticky and slightly plastic; strongly effervescent, calcium carbonate as common fine concretions and thin pendants on undersides of rock fragments; 10 percent gravel, 30 percent cobbles, and 5 percent stones; moderately alkaline; abrupt irregular boundary.

R—13 inches; limestone bedrock.

The surface is 30 to 60 percent covered with limestone cobbles, channers, and flagstones. The depth to bedrock ranges from 6 to 20 inches. The Bk horizon is 40 to 80 percent rock fragments. Calcium carbonate equivalent in this horizon is 15 to 35 percent.

Vensora Series

The Vensora series consists of very deep, poorly drained soils in mountain valleys. They formed in alluvium derived from granite. Slope ranges from 0 to 3 percent.

Elevation is 7,800 to 9,500 feet, average annual precipitation is 15 to 19 inches, and average annual air temperature is 38 to 40 degrees F. Frost-free period is less than 60 days.

Typical pedon of Vensora loam, in an area of Silas, gravelly substratum-Vensora loams, 0 to 6 percent slopes, 1,800 feet north, 1,300 feet west of the southeast corner of sec. 27, T. 18 N., R. 72 W.

A1—0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate coarse granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; common very fine continuous pores; 5 percent gravel; neutral; gradual irregular boundary.

A2—7 to 17 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; few fine prominent yellowish brown (10YR 5/8) moist, mottles; moderate medium granular structure; hard, friable, slightly sticky and plastic; many fine and common medium roots; common very fine continuous pores; 5 percent gravel; neutral; gradual irregular boundary.

Cg1—17 to 30 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; common large prominent gray (5YR 5/1) moist, mottles; massive; hard, firm, sticky and plastic; few medium roots; common very fine and fine continuous pores; 10 percent cobbles; neutral; gradual irregular boundary.

2Cg2—30 to 60 inches; yellowish brown (10YR 5/6) very gravelly sandy clay loam stratified with thin layers of sandy loam and loam, dark yellowish brown (10YR 4/6) moist; few thin prominent bands of gray (5YR 5/1), moist, mottles and many medium prominent strong brown (7.5YR 5/8) moist, mottles; massive; hard, firm, slightly sticky and slightly plastic; common very fine and fine continuous pores; 10 percent cobbles and 30 percent fine granitic gravel; neutral.

Reaction is neutral or slightly alkaline throughout the profile. The depth to a seasonal high water table is .5 to 2.5 feet from April through July. The A horizon has hue of 10YR or 2.5Y. This horizon is 0 to 10 percent gravel. The Cg1 horizon commonly has a texture of loam or gravelly loam, but the texture is sandy clay loam or gravelly sandy clay loam in some pedons. Hue of the Cg1 horizon is 10YR to 5Y. The 2Cg2 horizon has a dominant texture of very gravelly sandy clay loam or very gravelly sandy loam, but in many pedons thin layers of loam or sandy loam also occur. This horizon averages 35 to 55 percent rock fragments. Hue of the 2Cg2 horizon is 10YR or 7.5YR.

Wycolo Series

The Wycolo series consists of moderately deep, well drained soils on cuesta dip slopes, hills, cuesta escarpment, structural benches, and terraces. They formed in residuum derived from interbedded sandstone and shale. Slope ranges from 2 to 20 percent. Elevation is 6,000 to 7,800 feet, average annual precipitation is 10 to 14 inches, and average annual air temperature is 40 to 45 degrees F. Frost-free period is 85 to 110 days.

Typical pedon of Wycolo fine sandy loam, in an area of Wycolo-Alcova complex, 3 to 10 percent slopes, 525 feet west, 875 feet south of the northeast corner of sec. 24, T. 13 N., R. 75 W.

A—0 to 3 inches; light brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine discontinuous pores; few very fine and fine roots; slightly alkaline; abrupt smooth boundary.

AB—3 to 6 inches; reddish brown (5YR 5/3) sandy loam, reddish brown (5YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine discontinuous pores; few very fine and fine roots; slightly alkaline; clear smooth boundary.

Bt—6 to 12 inches; brown (7.5YR 5/4) sandy clay loam, brown (7.5YR 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; few very fine discontinuous pores; few very fine and fine roots; few faint clay films on faces of peds; slightly alkaline; clear smooth boundary.

Bk1—12 to 20 inches; pink (7.5YR 7/4) loam, brown (7.5YR 5/4) moist; weak fine prismatic structure; soft, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine discontinuous pores; strongly effervescent, calcium carbonate is disseminated and has a 17 percent calcium carbonate equivalent; moderately alkaline; gradual smooth boundary.

Bk2—20 to 25 inches; pink (7.5YR 7/4) clay loam, light brown (7.5YR 6/4) moist; weak moderate prismatic structure; slightly hard, firm, sticky and plastic; few very fine and fine roots; common very fine discontinuous pores; violently effervescent, calcium carbonate is disseminated and also occurs as common fine soft masses, 23 percent calcium carbonate equivalent; 10 percent soft shale fragments less than 1/4 inch in diameter; moderately alkaline; clear smooth boundary.

Bk3—25 to 36 inches; light reddish brown (5YR 6/4) clay loam, reddish brown (5YR 4/4) moist; massive; slightly hard, firm, sticky and plastic; few very fine discontinuous pores; strongly effervescent, calcium carbonate is disseminated and also occurs as few fine soft masses; 50 percent soft shale fragments that break down when wetted, less than 1/4 inch in

diameter; moderately alkaline; gradual smooth boundary.

Cr—36 inches; weakly consolidated red shale with common gypsum seams.

The depth to bedrock ranges from 20 to 40 inches. The A horizon has hue of 7.5YR or 5YR. The A and Bt horizons have slightly alkaline or moderately alkaline reactions. The Bt horizon has a texture of sandy clay loam or loam. The Bk horizon commonly has a texture of loam, clay loam, or sandy clay loam, but is sandy loam in some pedons. Calcium carbonate equivalent is 15 to 25 percent in the Bk1 and Bk2 horizons and 10 to 20 percent in the Bk3 horizon.

Formation of the Soils

Larry C. Munn, Ph.D, University of Wyoming at Laramie, assisted in the preparation of this section.

Many of the mounds in the Laramie Basin are thought to be relict frost-churned features which developed during the height of the last Pleistocene glacial period, approximately 25,000 to 10,000 years ago. During this period, when many of Wyoming's mountain ranges were being scoured and shaped by glacial ice, the high basins of Wyoming had cold, tundra-type environments with permafrost present. Landscapes which were stable during and since this period retain features such as the mounds, developed by the intense frost action associated with permafrost.

Climate

The components of climate are precipitation, temperature, humidity, wind, and sunshine. Climate affects the type of vegetation growing in an area, the rate at which this vegetation decomposes, the rate at which rocks and minerals weather, and the depth to which physical and chemical changes extend into the soil.

The Laramie Basin has warm summers and cold winters with 10 to 14 inches of annual precipitation. The Laramie and Medicine Bow Ranges have cool summers and cold winters with 15 to 19 inches of annual precipitation. Humidity is rather low; wind and sunshine are relatively abundant. The high elevation causes rapid nightly cooling.

In the open mountain areas, the soils have darker colored surfaces compared to soils of the basin. This is caused by several factors. These mountain soils receive more precipitation, resulting in the production of more vegetation and the eventual addition of more organic matter to the soil. The temperatures are cooler, which reduces the amount of moisture lost to evaporation, increasing effective precipitation. Cooler temperatures also reduce the activity of micro-organisms that decompose vegetation, resulting in more build-up of organic matter in the soil. The Diamondville and Lymanson soils formed in similar parent material that reflect the above differences due to these climatic variables.

Temperature and precipitation are involved in the freezing and thawing of soil and geologic materials. Water penetrates cracks of the geologic material and is adsorbed by soil particles. The volume is expanded when the water freezes. Simple wetting and drying of the soil also causes expansion and contraction. Amount of precipitation directly influences the depth to which salts, carbonates, and clay particles are moved in the soil. Excessive precipitation can not be held by the vegetation, so runoff causes erosion and subsequent deposition of sediment. Removal or addition of material at a rate faster than the rate of soil formation counteracts soil formation.

Humidity is closely related to precipitation in its effects on vegetation. The higher the humidity, the more favorable the conditions for the growth of most plants. Wind combined with the normally low humidity keeps the surface layer dry after late spring and early summer. Wind has modified the soils of the basin during exceptionally dry periods by removing clay and fine silt from the surface layer and concentrating sand-size particles. The effect is an abundance of sandy loam and fine sandy loam surface layers. Forelle fine sandy loam is an example of a soil with such a surface layer.

Sunshine directly and indirectly affects soil formation. Sunshine increases soil temperature, increasing the rate of chemical reaction and microbial activity. By affecting higher plants, sunshine indirectly influences soil formation.

Living Organisms

Plants and animals play an important role in the formation of soils. It is debatable whether soil could even form in the absence of these organisms. By "living organisms", we refer to all plants and animals associated with soil.

Bacteria, fungi, algae, lichens, and mosses are some of the lower forms of life in soils. Bacteria and fungi recycle nutrients back into the soil by decomposing dead plant and animal matter. Algae, lichens, and mosses influence soil formation by the excretion of weak acids that promote the decomposition of rocks.

Grasses, shrubs, and trees are some of the higher forms of plant life associated with soil formation. They

remove water and nutrients through growth. Their roots invade cracks and crevices, forcing rocks apart. When they die, their tissues give nutrients back to the soil.

Soils formed under grass-shrub vegetation generally have different characteristics than those formed under forests. The Ansel and Quander soils formed in similar parent material, but differ mainly because of vegetational effects. Soils formed under grasses, like the Quander soil, have organic matter distributed throughout the soil because of numerous, fine, readily decomposable roots. Forest soils, such as Ansel, concentrate organic matter nearer the surface and tend to be more acidic than grassland soils. Forest litter forms a weak acid that tends to leach iron and aluminum compounds downward in the soil profile.

Protozoa, nematodes, earthworms, and insects are examples of lower forms of animal life in soil. Higher forms of animal life are mice, moles, rabbits, gophers, prairie dogs, and badgers. All these organisms modify soil by feeding on plant and animal matter. As they tunnel and burrow through the soil they mix the soil horizons.

Humans also greatly affect the soil. We till the soil, irrigate the normally dry soils, and drain the wet soils. We add chemicals and materials high in organic matter to create better growing conditions for our crops. We sometimes accelerate erosion and thus produce less fertile soils. We also cover the surface with buildings and asphalt and thus interrupt the exchange of water, oxygen, and carbon dioxide between the soil and atmosphere.

Parent Material

Parent material is the unconsolidated material in which soil forms. Type of parent material affects the chemical and physical properties of the soil and the rate at which soil forms. The soils of Albany County have formed in four basic parent materials: igneous, metamorphic, and sedimentary rocks, and alluvium. These parent materials vary a great deal in composition and age.

The igneous and metamorphic materials are in the Laramie Range of the eastern one-third of the county and the Medicine Bow Range of the southwest corner. These materials have a geologic age of over a billion years, yet the mountain ranges were formed only 60 million years ago. Boyle, Hapjack, Lakehelen, Lininger, and Rogert are examples of igneous-derived soils. Soils formed from metamorphic rock are Bonjea, Bowen, and Poin.

The sedimentary formations of Albany County are primarily in the northern two-thirds of the Laramie Basin. These formations range in age from 3 million to 300 million years. Generally speaking, the formations are of younger age nearer the center of the basin. Some of the more common sedimentary formations are the Hanna, Niobrara, Steele, White River, and Wind River. These formations are mostly brown, buff, and gray sandstones and shales. Blazon, Elkol, Rock River, Satanka, and Tisworth are examples of associated soils.

Several unique sedimentary formations are the Casper, Chugwater, and Mowry. These formations have associated soils usually not found on other formations. Casper limestone and sandstone are along the western flank of the Laramie Range. The range has very cobbly limestone soils such as Bruja and Pilotpeak. Chugwater red siltstone and shale are in the northern and southern ends of the basin. Reddish soils such as Almy, Joemre, and Rohonda are associated with these "redbeds". Mowry shale is in the northern portions of the basin. Bentonite beds and fine textured soils such as Kemmerer, Moyerson, and Pinelli are associated with this formation.

The alluvial materials range in age from about 3 million years old to the present day, and are mostly in the southern one-third of the Laramie Basin. The younger alluvium is along streams, rivers, and drainages; the older alluvium is at slightly higher elevations on older terraces. Canburn, Glendive, Grenoble, and Redrob soils are in the younger alluvium; Alcova, Bosler, Forelle, Pahlow, and Rock River soils are in the older alluvium.

Relief

Relief influences soil formation by affecting microclimate, erosion, and drainage. The four main components of relief are: slope, aspect, relative landscape position, and elevation.

Soils that form on steeper slopes are generally thinner, have fewer horizons, and support less vegetation. Steep slopes have more runoff of precipitation and sediment. The loss of moisture reduces the amount of vegetation and organic matter in the soil, slowing the rate of horizon development. The erosion tends to remove the soil material as it forms. Blazon, Moyerson, Rogert, and Thermopolis are examples of soils on steep slopes.

Aspect, especially in areas that have more than 15 inches of annual precipitation, is another important component of relief. Soils formed on north- and east-facing slopes have different characteristics than those on south- and west-facing slopes. These differences are the result of differences in soil moisture and temperature. North and east slopes have slightly lower temperatures because they receive less direct sunlight. Winter winds deposit snow on these slopes, and most of the water from the snow enters the soil. This results in more lush vegetation and thicker, more developed soil horizons. Lower soil temperature reduces the activity of the micro-organisms that break down organic matter. This increases organic matter content in the soil, yielding somewhat thicker and darker surface horizons. These trends can be observed by examination of the soils on various aspects.

Relative position on the landscape is important when comparing soil formation between soils high on a slope to those lying lower. Higher-lying erosive soils, such as Blazon, Delphill, Hapjack, and Poin, lose water and soil material through runoff. Lower-lying depositional areas collect this additional water and soil. The soils are deeper, have more lush vegetation, and have thicker, darker surface layers. Alcova, Forelle, and Center Creek are examples. In areas adjacent to streams, the soils may be subject to flooding or have a high water table. Grenoble, Redrob, and Silas are examples.

Elevation affects soil formation mainly through its effect on soil temperature and precipitation. As elevation increases, soil temperature decreases and precipitation increases. In areas of low soil temperature the rate of chemical, physical, and biological soil processes are slower. Higher amounts of precipitation produce more vegetation resulting in a higher amount of organic matter in the soil. This also promotes the development of soil horizons.

Time

The length of time required for various horizons in a soil to form is dependent upon the other four soil-forming factors. For example, B horizons form more quickly in soils on less sloping sites than on steeper sites. The age of a soil is reflected in its degree of development. An old, or mature, soil is one that is in equilibrium with its setting on a stable landscape position.

Our life span is very short compared to the time necessary to form a mature soil. Although variable, it is thought that several tens of thousands of years is the amount of time required to develop a B horizon with significant accumulations of clay. Grenoble and Glendive soils are examples of young soils that formed in fairly recent alluvium. Blackhall and Thermopolis are examples of young soils formed in residuum. All these soils have thin, somewhat darkened A horizons overlying C horizons. Due to instability of the landscapes they occupy, most of these are less than several thousand years old.

Fiveoh and Luhon soils are examples of soils of intermediate age. Over a period of several thousand to several tens of thousands of years, they have developed somewhat darkened A horizons, and an upper B horizon with good structure and a color that has a higher chroma than underlying horizons. In addition, some of the calcium carbonate has been removed from the upper layers of the soil and deposited in the underlying layers. The Luhon and Fiveoh soils have a significant accumulation of calcium carbonate, and a calcic horizon has formed in these soils.

Some soils have somewhat darkened A horizons and B horizons with a significant accumulation of clay that were formed in several tens of thousands to as much as several hundreds of thousands of years. Bosler, Forelle, Hilltoppe, and Leavitt are examples. In addition, the Hilltoppe soil has a large amount of calcium carbonate which accumulated in the form of a cemented layer.

References

American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.

American Society for Testing and Materials. 1996. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.

Brink, B.E. 1986. Wyoming: land of echoing canyons.

Murray, R.A. 1974. Military posts of Wyoming.

United States Department of Agriculture. 1993. Soil survey manual. U.S. Dep. Agric. Handb. 18.

United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436.

Wyoming Recreation Commission. 1976. Wyoming: a guide to historic sites.

Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone. The material washed down the sides of mountains and hills by ephemeral streams and deposited at the mouth of gorges in the form of a moderately steep, conical mass descending equally in all directions from the point of issue.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal-unit-month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Arroyo. The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in alluvium.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3.5
Low	3.5 to 5
Moderate	5 to 7.5
High	more than 7.5

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Bajada. A broad alluvial slope extending from the base of a mountain range out into a basin and formed by coalescence of separate alluvial fans.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep to very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to reduce or eliminate competition of woody vegetation to allow understory grasses and forbs to recover, or to make conditions favorable for reseeding. It increases production of forage, which reduces erosion. Brush management may improve the habitat for some species of wildlife.

Butte. An isolated small mountain or hill with steep or precipitous sides and a top variously flat, rounded, or pointed that may be a residual mass isolated by erosion or an exposed volcanic neck.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Canyon. A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that is 15 to 35 percent, by volume, thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. Very channery soil material is 35 to 60 percent of these rock fragments, and extremely channery soil material is more than 60 percent. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation by use of chemicals.

Cirque. Semicircular, concave, bowllike areas that have steep faces primarily resulting from glacial ice and snow abrasion.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter, in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay skin. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay film.

Climax plant community. The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

Coarse fragments. Mineral or rock particles larger than 2 millimeters in diameter.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Very cobbly soil material is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is more than 60 percent.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Congeliturbation. The disturbing of soil material by frost action.

Conglomerate. A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer material. Conglomerate is the consolidated equivalent of gravel.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—Readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—Adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 inches.

Coppice dune. A small dune of fine-grained soil material stabilized around shrubs or small trees.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Critical area planting. Planting vegetation, such as trees, shrubs, grasses, or legumes, on highly erodible or critically eroding areas.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cuesta. An asymmetric, homoclinal ridge capped by resistant rock layers of slight to moderate dip.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Desert pavement. A layer of gravel or coarser fragments on a desert soil surface that was emplaced by upward movement of fragments from underlying sediment or remains after finer particles have been removed by running water or wind.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming with the dip of underlying bedded rock.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—These soils have very high and high hydraulic conductivity and low water holding capacity. They are not suited to crop production unless irrigated.

Somewhat excessively drained.—These soils have high hydraulic conductivity and low water holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

Well drained.—These soils have intermediate water holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

Moderately well drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless artificial drainage is provided. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet

layer relatively high in the profile, additions of water by seepage, or some combination of these.

Somewhat poorly drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

Poorly drained.—These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

Very poorly drained.—These soils are wet to the surface most of the time. They are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley, generally more open and with broader bottom land than a ravine or gulch.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that havelost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature; for example, fire that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and produced by erosion or faulting. Synonym: scarp.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine earth. The particles of the soil that are smaller than 2 millimeters in diameter, or the sand, silt, and clay portion of the soil. (See Texture, soil.)

Fine textured soil. Sandy clay, silty clay, and clay.

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material is 35 to 60 percent flagstones, and extremely flaggy soil material is more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders

a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (or 300 meters) and fringes a mountain range or high-plateau escarpment.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard rock. Rock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well-defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual.* The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, alluminum, or some combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which

the solum formed. If the material is known to differ from that in the solum, the number 2 precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand and loamy sand.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mesa. A broad, nearly flat topped and commonly isolated upland mass characterized by summit widths that are more than the heights of bounding erosional scarps.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides and considerable bare-rock surface. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color in hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Observed rooting depth. Depth to which roots have been observed to penetrate.

Open space. A relatively undeveloped green or wooded area provided mainly within an urban area to minimize feelings of congested living.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed. (See Climax plant community.)

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. The application of fire to land under such conditions of weather, soil moisture, and time of day as presumably will result in the intensity of heat and spread required to accomplish specific forest management, wildlife, grazing, or fire hazard reduction purposes.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This increases the vigor and reproduction of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Range renovation. Practices such as furrowing on the contour, pitting, chiseling, or disking. Improves plant cover by increasing water infiltration and available moisture.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity, expressed as pH values, are:

Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata mainly red in color and composed largely of sandstone and shale.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables.) Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site class. A grouping of site indexes into 5 to 7 production capability levels. Each level can be represented by a site curve.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

Nearly level	0 to 3 percent
Gently sloping	3 to 8 percent
Strongly sloping	8 to 15
Moderately steep	15 to 25
Steep	25 to 45
Very steep	45 and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium absorption ratio (SAR) of a saturation extract, at the ratio of Na^+ to Ca^{++} + Mg^{++}.

Soft rock. Rock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil depth. The thickness of the soil mantle over bedrock; i.e., very shallow is 4 to 10 inches thick, shallow is 10 to 20 inches thick, moderately deep is 20 to 40 inches thick, deep is 40 to 60 inches thick, very deep is more than 60 inches thick.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 6 to 15 inches (15 to 38 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Strath Terrace. Erosional surfaces cut on sedimentry bedrock and thinly mantled with Pleistocene alluvium.

Structural Bench. A nearly level or gently inclined erosional surface developed on resistant strata in areas where valleys are cut in alternating strong and weak horizontal sedimentary beds.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summer wildlife habitat. A population or portion of a population uses this habitat annually during the summer, but not during the winter.

Surface layer. In tilled soils, the part of the soil ordinarily moved in tillage ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon." In uncultivated soils, the part of the soil designated as the "A horizon."

Tail water. The water just downstream of a structure.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The action of uprooting and tipping over trees by the wind.

Winter wildlife habitat. A population or portion of a population uses this habitat annually only during the winter. A substantial number of animals use the habitat during this period.

Year-long wildlife habitat. A population or a substantial portion of a population uses this habitat during all seasons of the year.

Tables

TABLE 1a.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1949-93 at Laramie FAA Airport)

Month	Temperature						Precipitation			
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more
	°F	°F	°F	°F	°F	Units	In	In	In	
January-----	32.2	8.4	20.3	54	-30	1	0.47	0.16	0.72	1
February----	35.3	11.1	23.2	57	-22	3	0.42	0.17	0.64	1
March-------	40.3	16.4	28.3	63	-13	13	0.78	0.32	1.16	2
April-------	50.8	24.3	37.5	73	0	76	0.97	0.45	1.41	2
May---------	61.5	33.4	47.4	81	17	251	1.47	0.62	2.20	4
June--------	72.9	41.9	57.4	89	27	524	1.28	0.58	1.89	3
July--------	79.8	47.7	63.7	91	36	704	1.63	0.80	2.35	4
August------	77.9	45.9	61.9	89	33	681	1.21	0.59	1.75	3
September---	69.1	37.4	53.3	85	17	407	0.87	0.31	1.37	2
October-----	57.4	27.8	42.6	76	3	159	0.72	0.22	1.15	2
November----	42.0	16.9	29.4	65	-15	21	0.61	0.23	0.95	2
December----	34.1	10.6	22.3	55	-25	3	0.42	0.12	0.67	1
Yearly:										
Average---	54.4	26.8	40.6	---	---	---	---	---	---	---
Extreme---	95	-50	---	92	-34	---	---	---	---	---
Total-----	---	---	---	---	---	2,844	10.85	8.91	12.56	27

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 40 deg. F)

TABLE 1b.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1949-93 at Centennial 1 N, 1610)

Month	Temperature						Precipitation			
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more
	°F	°F	°F	°F	°F	Units	In	In	In	
January-----	32.5	12.3	22.4	53	-24	1	1.07	0.45	1.65	3
February----	34.9	14.1	24.5	55	-20	2	0.83	0.35	1.24	2
March-------	39.3	17.0	28.1	59	-11	6	1.09	0.50	1.59	3
April-------	49.2	24.6	36.9	69	0	59	1.21	0.62	1.73	3
May---------	59.2	32.8	46.0	75	15	201	1.64	0.92	2.28	5
June--------	70.1	40.5	55.3	85	26	438	1.44	0.60	2.15	3
July--------	77.0	46.6	61.8	88	33	634	1.67	0.69	2.50	4
August------	75.1	44.7	59.9	86	31	567	1.29	0.72	1.79	4
September---	67.5	37.3	52.4	83	18	358	1.16	0.40	1.78	3
October-----	56.7	29.4	43.0	72	7	140	0.78	0.29	1.22	2
November----	41.6	19.6	30.6	63	-11	17	0.98	0.44	1.49	3
December----	34.0	14.1	24.1	54	-18	2	1.04	0.41	1.63	3
Yearly:										
Average---	53.1	27.7	40.4	---	---	---	---	---	---	---
Extreme---	95	-45	---	91	-28	---	---	---	---	---
Total-----	---	---	---	---	---	2,425	14.19	8.12	17.78	38

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 40.0 deg. F)

TABLE 1c.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1949-79 at Foxpark, 3630)

Month	Temperature						Precipitation			
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more
	°F	°F	°F	°F	°F	Units	In	In	In	
January-----	26.6	5.7	16.2	45	-33	0	1.60	0.75	2.33	4
February----	29.3	6.1	17.7	45	-27	0	1.19	0.59	1.72	4
March-------	33.9	9.7	21.8	51	-26	0	1.50	0.75	2.16	5
April-------	42.5	18.5	30.5	61	-9	9	1.45	0.56	2.20	4
May---------	53.5	26.4	40.0	70	8	77	1.46	0.77	2.05	3
June--------	65.3	33.1	49.2	81	20	272	1.58	0.40	2.51	3
July--------	72.4	37.4	54.9	83	22	426	1.53	0.75	2.20	5
August------	69.9	35.9	52.9	82	20	379	1.64	1.05	2.17	5
September---	62.6	29.7	46.1	77	13	203	1.23	0.60	1.86	4
October-----	51.9	22.8	37.3	67	0	48	0.95	0.30	1.55	2
November----	36.3	13.5	24.9	54	-17	1	1.05	0.41	1.72	3
December----	28.8	7.6	18.2	46	-24	0	1.15	0.50	1.78	3
Yearly:										
Average---	47.8	20.5	34.1	---	---	---	---	---	---	---
Extreme---	89	-49	---	86	-36	---	---	---	---	---
Total-----	---	---	---	---	---	1,413	16.32	11.10	19.73	45

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold: 40 deg. F)

TABLE 2a.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1949-93 at Laramie FAA Airport, 5415)
(Missing days: from 1949 to 1993: 2 in spring and 0 in fall)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 26	June 7	June 25
2 years in 10 later than--	May 20	June 1	June 19
5 years in 10 later than--	May 9	May 21	June 7
First freezing temperature in fall:			
1 year in 10 earlier than--	Sep. 14	Sep. 8	Aug. 28
2 years in 10 earlier than--	Sep. 19	Sep. 12	Sep. 2
5 years in 10 earlier than--	Sep. 30	Sep. 21	Sep. 11

TABLE 2b.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1949-93 at Centennial 1 N, 1610)
(Missing days: from 1949 to 1993: 4 in spring and 4 in fall)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 28	June 23	July 9
2 years in 10 later than--	May 23	June 15	July 2
5 years in 10 later than--	May 13	June 1	June 18
First freezing temperature in fall:			
1 year in 10 earlier than--	Sep. 13	Sep. 2	Aug. 18
2 years in 10 earlier than--	Sep. 19	Sep. 8	Aug. 25
5 years in 10 earlier than--	Sep. 30	Sep. 19	Sep. 7

TABLE 2c.--FREEZE DATES IN SPRING AND FALL

(Recorded in the period 1949-79 at Foxpark, 3630)
(Missing days from 1949 to 1979: 4 in spring and 1 in fall)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	July 10	July 26	Aug. 2
2 years in 10 later than--	July 2	July 19	July 29
5 years in 10 later than--	June 17	July 7	July 22
First freezing temperature in fall:			
1 year in 10 earlier than--	Aug. 19	Aug. 4	July 31
2 years in 10 earlier than--	Aug. 27	Aug. 9	Aug. 2
5 years in 10 earlier than--	Sep. 10	Aug. 19	Aug. 7

TABLE 3a.--GROWING SEASON

(Recorded in the period 1949-93 at Laramie FAA Airport)
(2 years from 1949-93 have 25 days or more missing data)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	112	97	72
8 years in 10	119	104	79
5 years in 10	132	117	94
2 years in 10	145	129	109
1 year in 10	152	136	117

TABLE 3b.--GROWING SEASON

(Recorded in the period 1949-93 at Centennial 1 N, 1610)
(5 years from 1949-93 have 25 days or more missing data)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	102	80	48
8 years in 10	110	88	58
5 years in 10	125	103	78
2 years in 10	140	118	98
1 year in 10	148	126	109

TABLE 3c.--GROWING SEASON

(Recorded in the period 1949-79 at Foxpark, 3630)
(4 years from 1949-79 have 25 days or more missing data)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	33	15	4
8 years in 10	42	22	8
5 years in 10	59	35	17
2 years in 10	77	48	25
1 year in 10	86	55	30

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
100	Aberone gravelly sandy loam, 0 to 15 percent slopes	1,351	0.1
101	Abston-Bullock complex, 5 to 25 percent slopes	8,070	0.3
102	Alcova-Borollic Camborthids complex, 0 to 8 percent slopes	42,054	1.8
103	Alcova, shallow substratum-Lupinto-Dahlquist complex, 0 to 8 percent slopes	21,002	0.9
104	Alcova, calcareous subsoil-Rock River complex, 0 to 8 percent slopes	30,484	1.3
105	Almy loam, 0 to 8 percent slopes	13,927	0.6
106	Almy-Urban land complex, 0 to 3 percent slopes	480	*
107	Almy-Tismid association, 0 to 8 percent slopes	3,726	0.2
108	Alogia loam, 0 to 3 percent slopes	4,436	0.2
109	Alogia-Urban land complex, 0 to 3 percent slopes	450	*
110	Anchutz sandy loam, 1 to 8 percent slopes	27,049	1.2
111	Ansel-Granile gravelly sandy loams, 6 to 45 percent slopes	3,560	0.2
112	Bateson-Shirleybasin association, 1 to 15 percent slopes	5,817	0.3
113	Blackhall-Browtine, moist, complex, 15 to 45 percent slopes	3,731	0.2
114	Blackhall-Satanka-Rock outcrop complex, 5 to 20 percent slopes	15,308	0.7
115	Blazon-Chaperton complex, moist, 3 to 20 percent slopes	478	*
116	Blazon-Delphill complex, 20 to 45 percent slopes	15,690	0.7
117	Bonjea-Chugcreek-Rock outcrop complex, 3 to 15 percent slopes	44,836	1.9
118	Bonjea-Rock outcrop-Chugcreek complex, 15 to 40 percent slopes	53,168	2.2
119	Bosler fine sandy loam, wet substratum, 0 to 3 percent slopes	10,455	0.5
120	Bosler-Borollic Camborthids complex, 0 to 8 percent slopes	23,488	1.0
121	Bosler, wet substratum-Urban land complex, 0 to 3 percent slopes	265	*
122	Boyle-Alderon-Cathedral gravelly sandy loams, 5 to 25 percent slopes	7,774	0.3
123	Boyle-Boyle, thin solum, gravelly sandy loams, 3 to 6 percent slopes	6,367	0.3
124	Boyle-Rock outcrop complex, 5 to 25 percent slopes	66,548	2.8
125	Boyle-Lininger association, 1 to 15 percent slopes	55,590	2.3
126	Browtine very gravelly fine sandy loam, 0 to 8 percent slopes	14,562	0.6
127	Browtine-Hilltoppe very gravelly sandy loams, 0 to 8 percent slopes	5,233	0.2
128	Bruja-Canwall-Telecan association, 3 to 60 percent slopes	9,977	0.4
129	Buffork-Bucklon sandy loams, 15 to 60 percent slopes	4,435	0.2
130	Byrnie-Rock outcrop complex, 10 to 50 percent slopes	12,191	0.5
131	Calciborolls, 0 to 3 percent slopes	1,186	0.1
132	Canburn loam, 1 to 4 percent slopes	3,619	0.2
133	Cantle loam, 0 to 3 percent slopes	10,336	0.4
134	Carbol-Rock outcrop complex, 25 to 50 percent slopes	4,910	0.2
135	Carmody-Edlin fine sandy loams, 15 to 45 percent slopes	1,391	0.1
136	Carmody-Ryan Park fine sandy loams, 6 to 15 percent slopes	11,765	0.5
137	Cathedral-Spinekop-Rock outcrop complex, 0 to 40 percent slopes	16,997	0.7
138	Center Creek loam, 0 to 3 percent slopes	5,285	0.2
139	Chaperton, moderately saline-Blazon complex, 8 to 20 percent slopes	25,509	1.1
140	Chaperton-Poposhia complex, 3 to 30 percent slopes	4,891	0.2
141	Cheadle-Passcreek, cobbly subsoil-Rock outcrop complex, 5 to 25 percent slopes	15,132	0.7
142	Cheadle-Rock outcrop-Miracle complex, 5 to 40 percent slopes	7,162	0.3
143	Cryaquolls, 1 to 9 percent slopes	4,397	0.2
144	Cryoborolls, 6 to 30 percent slopes	3,041	0.1
145	Cushool-Cutback complex, 2 to 10 percent slopes	21,649	0.9
146	Cushool-Diamondville fine sandy loams, 0 to 3 percent slopes	6,959	0.3
147	Cutback-Pinelli complex, 1 to 25 percent slopes	12,701	0.5
148	Dahlquist-Rawlins-Browtine complex, moist, 3 to 15 percent slopes	22,687	1.0
149	Dalecreek-Kovich complex, 0 to 9 percent slopes	22,205	1.0
150	Delphill-Blazon complex, 3 to 20 percent slopes	15,477	0.7
151	Diamondville-Cushool complex, 3 to 15 percent slopes	68,302	2.9
152	Diamonkit-Stylite sandy loams, 3 to 15 percent slopes	4,822	0.2
153	Elkol clay loam, 0 to 8 percent slopes	9,739	0.4
154	Elkol-Gerdrum Family complex, 1 to 8 percent slopes	30,583	1.3
155	Elkol-Gerdrum Family, overflow complex, 0 to 3 percent slopes	12,564	0.5
156	Evanston fine sandy loam, 0 to 6 percent slopes	836	*
157	Evanston-Bonjea complex, 5 to 40 percent slopes	5,046	0.2
158	Fiveoh-Fiveoh, cobbly substratum-Ryan Park complex, 1 to 8 percent slopes	14,912	0.6
159	Fiveoh, cobbly substratum-Fiveoh-Urban land complex, 1 to 5 percent slopes	350	*
160	Fiveoh, cobbly substratum-Joemre fine sandy loams, 1 to 5 percent slopes	18,525	0.8

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
161	Folavar very gravelly sandy loam, 0 to 3 percent slopes	2,729	0.1
162	Folavar-Borollic Camborthids complex, 0 to 3 percent slopes	8,651	0.4
163	Forelle loam, 0 to 6 percent slopes	48,383	2.1
164	Forelle-Urban land complex, 0 to 3 percent slopes	290	*
165	Forelle-Diamondville association, 3 to 15 percent slopes	65,337	2.7
166	Glendive-Redrob-Grenoble complex, 0 to 3 percent slopes	14,563	0.6
167	Grenoble-Gerrard complex, 0 to 3 percent slopes	6,668	0.3
168	Greyback very cobbly sandy loam, 1 to 6 percent slopes	4,043	0.2
169	Gypla loam, 0 to 3 percent slopes	3,195	0.1
170	Gypla-Urban land complex, 0 to 1 percent slope	850	*
171	Hanson-Quander complex, 3 to 15 percent slopes	8,701	0.4
172	Hapjack-Rogert-Amesmont complex, 3 to 25 percent slopes	90,133	3.8
173	Ipson-Evanston complex, 6 to 30 percent slopes	2,195	0.1
174	Joemre fine sandy loam, 3 to 6 percent slopes	21,088	0.9
175	Joemre fine sandy loam, 6 to 15 percent slopes	806	*
176	Kezar-Carbol-Rock outcrop complex, 5 to 25 percent slopes	35,051	1.5
177	Kildor-Rock outcrop association, 5 to 50 percent slopes	2,314	0.1
178	Kiltabar-Tismid complex, 0 to 3 percent slopes	23,095	1.0
179	Lakehelen-Redfeather-Amesmont complex, 5 to 20 percent slopes	4,693	0.2
180	Leavitt gravelly fine sandy loam, 1 to 8 percent slopes	2,666	0.1
181	Leavitt-Granile complex, 3 to 45 percent slopes	1,369	0.1
182	Leavitt-Hanson complex, 3 to 30 percent slopes	1,058	*
183	Leavitt-Quander complex, 15 to 45 percent slopes	8,611	0.4
184	Luhon loam, 1 to 5 percent slopes	17,729	0.8
185	Luvar-Stylite-Diamonkit complex, 1 to 8 percent slopes	22,097	1.0
186	Lymanson loam-Lymanson cobbly loam complex, 6 to 20 percent slopes	5,225	0.2
187	Manada sandy loam, 0 to 6 percent slopes	8,056	0.3
188	McFadden gravelly fine sandy loam, 1 to 6 percent slopes	8,517	0.4
189	Miracle-Cheadle association, 5 to 20 percent slopes	8,119	0.3
190	Moyerson-Kemmerer complex, 3 to 20 percent slopes	13,426	0.6
191	Nathale-Passcreek, cobbly subsoil-Rock outcrop complex, 10 to 60 percent slopes	16,118	0.7
192	Pahlow gravelly sandy loam, 0 to 3 percent slopes	22,139	1.0
193	Pilotpeak-Canwall complex, 3 to 20 percent slopes	41,031	1.8
194	Pinelli clay loam, 0 to 6 percent slopes	10,623	0.5
195	Pits, mine	1,382	0.1
196	Poin-Bowen-Rock outcrop complex, 10 to 50 percent slopes	3,239	0.1
197	Poposhia-Blazon complex, 3 to 15 percent slopes	3,715	0.2
198	Poposhia-Forelle complex, 1 to 8 percent slopes	64,623	2.7
199	Poposhia-Chaperton association, 6 to 12 percent slopes	37,212	1.6
200	Rainbolt-Morset association, 3 to 25 percent slopes	8,167	0.4
201	Redfeather-Lakehelen-Rogert complex, 20 to 50 percent slopes	5,771	0.2
202	Redrob loam, 0 to 2 percent slopes	935	*
203	Redrob, frequently flooded-Grenoble-Redrob complex, 0 to 3 percent slopes	12,529	0.5
204	Redrob, frequently flooded-Redrob loams, 0 to 3 percent slopes	16,401	0.7
205	Redrob, frequently flooded-Redrob-Urban land complex, 0 to 3 percent slopes	635	*
206	Rentsac-Wycolo complex, 2 to 15 percent slopes	5,629	0.2
207	Renvers-Chalkhill complex, 1 to 15 percent slopes	4,544	0.2
208	Rimton-Passcreek, cobbly subsoil-Miracle complex, 10 to 60 percent slopes	3,865	0.2
209	Riverwash	395	*
210	Rock outcrop-Bonjea complex, 40 to 60 percent slopes	47,207	2.0
211	Rock outcrop-Bruja-Byrnie complex, 30 to 70 percent slopes	2,376	0.1
212	Rock outcrop-Cathedral complex, 20 to 40 percent slopes	68,807	2.9
213	Rock outcrop-Cathedral-Alderon complex, 25 to 50 percent slopes	38,914	1.7
214	Rock outcrop-Pilotpeak complex, 3 to 25 percent slopes	11,073	0.5
215	Rock outcrop-Rogert complex, 25 to 99 percent slopes	27,164	1.2
216	Rock River sandy loam, 2 to 6 percent slopes	69,164	2.9
217	Rock River loam, 1 to 8 percent slopes, bouldery	6,606	0.3
218	Rock River-Urban land complex, 0 to 6 percent slopes	350	*
219	Rogert-Lakehelen-Rock outcrop complex, 8 to 40 percent slopes	15,907	0.7
220	Rogert-Rock outcrop-Amesmont complex, 5 to 25 percent slopes	70,260	2.9
221	Rohonda fine sandy loam, 3 to 6 percent slopes	4,064	0.2
222	Rohonda-Tieside complex, 3 to 10 percent slopes	19,575	0.8

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
223	Rohonda-Cheadle-Rock outcrop association, 6 to 45 percent slopes	2,887	0.1
224	Ryark loamy sand, 1 to 6 percent slopes	1,822	0.1
225	Shirleybasin-Twocabin-Lahtida complex, 0 to 15 percent slopes	13,745	0.6
226	Silas loam, 1 to 6 percent slopes	956	*
227	Silas, gravelly substratum-Vensora loams, 0 to 6 percent slopes	17,815	0.8
228	Stunner sandy loam, 2 to 8 percent slopes	37,294	1.6
229	Stunner-Borollic Camborthids complex, 2 to 5 percent slopes	21,519	0.9
230	Stunner-Tisworth-Blazon complex, 1 to 6 percent slopes	11,766	0.5
231	Stunner-Urban land complex, 0 to 6 percent slopes	185	*
232	Teeler very gravelly sandy loam, 5 to 40 percent slopes	1,555	0.1
233	Thiel-Lymanson-Leavitt complex, 5 to 20 percent slopes	6,730	0.3
234	Tieside-Pilotpeak-Rock outcrop complex, 3 to 10 percent slopes	21,636	0.9
235	Tismid sandy loam, 0 to 5 percent slopes	3,119	0.1
236	Tisworth-Gerdrum Family loams, 1 to 8 percent slopes	26,058	1.1
237	Tisworth-Gerdrum Family complex, 0 to 6 percent slopes	73,514	3.1
238	Tule-Chalkville loams, 0 to 15 percent slopes	6,859	0.3
239	Tyzak-Rock outcrop complex, 30 to 60 percent slopes	2,085	0.1
240	Wycolo sandy loam, 3 to 6 percent slopes	4,467	0.2
241	Wycolo-Alcova complex, 3 to 10 percent slopes	30,466	1.3
242	Wycolo-Alcova-Urban land complex, 3 to 6 percent slopes	570	*
243	Wycolo-Tieside sandy loams, 3 to 10 percent slopes	22,258	1.0
244	Wycolo-Thermopolis-Rock outcrop complex, 10 to 50 percent slopes	10,781	0.5
W	Water	26,846	1.2
	Total	2,320,491	100.0

* Less than 0.05 percent.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability		Alfalfa hay		Grass hay	
	N	I	N	I	N	I
			Tons	Tons	Tons	Tons
100----------- Aberone	IVe	---	---	---	---	---
101:						
Abston-------	VIe	---	---	---	---	---
Bullock------	VIe	---	---	---	---	---
102:						
Alcova-------	IVe	---	---	---	---	---
Borollic Camborthids.	VIs					
103:						
Alcova, shallow substratum--	IVe	---	---	---	---	---
Lupinto------	IVe	---	---	---	---	---
Dahlquist----	VIs	---	---	---	---	---
104:						
Alcova, calcareous subsoil-----	IVe	---	---	---	---	---
Rock River---	IVe	---	---	---	---	---
105----------- Almy	IVe	IVe	---	3.5	---	2.0
106*:						
Almy---------	IVc	---	---	---	---	---
Urban land.						
107*:						
Almy---------	IVc	---	---	---	---	---
Tismid-------	VIs	---	---	---	---	---
108----------- Alogia	IVs	IVs	---	2.5	---	2.0
109*:						
Alogia-------	IVs	---	---	---	---	---
Urban land.						

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability N	Land capability I	Alfalfa hay N	Alfalfa hay I	Grass hay N	Grass hay I
			Tons	Tons	Tons	Tons
110----------- Anchutz	IVe	---	---	---	---	---
111:						
Ansel--------	VIIe	---	---	---	---	---
Granile------	VIIe	---	---	---	---	---
112*:						
Bateson------	IVe	---	---	---	---	---
Shirleybasin-	IVe	---	---	---	---	---
113:						
Blackhall----	VIIe	---	---	---	---	---
Browtine, moist-------	VIIe	---	---	---	---	---
114*:						
Blackhall----	VIIe	---	---	---	---	---
Satanka------	VIe	---	---	---	---	---
Rock outcrop.	VIII					
115:						
Blazon-------	VIIe	---	---	---	---	---
Chaperton----	VIe	---	---	---	---	---
116:						
Blazon-------	VIIe	---	---	---	---	---
Delphill-----	VIIe	---	---	---	---	---
117*:						
Bonjea-------	VIIs	---	---	---	---	---
Chugcreek----	IVe	---	---	---	---	---
Rock outcrop.	VIIIs					
118:						
Bonjea-------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
Chugcreek----	VIIe	---	---	---	---	---
119----------- Bosler, wet substratum	IVw	IVw	---	3.5	---	2.0
120:						
Bosler-------	IVe	---	---	---	---	---
Borollic Camborthids.	VIs					

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability		Alfalfa hay		Grass hay	
	N	I	N	I	N	I
			Tons	Tons	Tons	Tons
121*:						
Bosler, wet substratum--	IVw	---	---	---	---	---
Urban land.						
122:						
Boyle--------	VIIe	---	---	---	---	---
Alderon------	VIe	---	---	---	---	---
Cathedral----	VIIe	---	---	---	---	---
123:						
Boyle--------	VIIs	---	---	---	---	---
Boyle, thin solum-------	VIIs	---	---	---	---	---
124*:						
Boyle--------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
125*:						
Boyle--------	VIIs	---	---	---	---	---
Lininger-----	VIs	---	---	---	---	---
126----------- Browtine	VIs	---	---	---	---	---
127:						
Browtine-----	VIs	VIs	---	---	---	2.0
Hilltoppe----	VIIs	VIIs	---	---	---	1
128*:						
Bruja--------	VIIe	---	---	---	---	---
Canwall------	VIe	---	---	---	---	---
Telecan------	IVe	---	---	---	---	---
129:						
Buffork------	VIIe	---	---	---	---	---
Bucklon------	VIIe	---	---	---	---	---
130*:						
Byrnie-------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
131. Calciborolls	IVe	IVe	---	---	---	2.5
132----------- Canburn	Vw	Vw	---	3	---	2

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability N	Land capability I	Alfalfa hay N	Alfalfa hay I	Grass hay N	Grass hay I
			Tons	Tons	Tons	Tons
133----------- Cantle	VIs	VIs	---	---	---	2
134*:						
Carbol--------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
135:						
Carmody------	VIIe	---	---	---	---	---
Edlin--------	VIIe	---	---	---	---	---
136:						
Carmody------	IVe	---	---	---	---	---
Ryan Park----	IVe	---	---	---	---	---
137*:						
Cathedral----	VIIe	---	---	---	---	---
Spinekop-----	IVe	---	---	---	---	---
Rock outcrop.	VIIIs					
138----------- Center Creek	IVw	IVw	---	---	---	3.0
139:						
Chaperton, moderately saline------	VIe	---	---	---	---	---
Blazon-------	VIIe	---	---	---	---	---
140:						
Chaperton----	VIe	---	---	---	---	---
Poposhia-----	VIe	---	---	---	---	---
141*:						
Cheadle------	VIIe	---	---	---	---	---
Passcreek, cobbly subsoil-----	VIe	---	---	---	---	---
Rock outcrop.	VIIIs					
142:						
Cheadle------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
Miracle------	VIIe	---	---	---	---	---
143. Cryaquolls	VIw					

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability		Alfalfa hay		Grass hay	
	N	I	N	I	N	I
			Tons	Tons	Tons	Tons
144. Cryoborolls	VIe					
145:						
Cushool	IVe	---	---	---	---	---
Cutback	IVe	---	---	---	---	---
146:						
Cushool	IVs	---	---	---	---	---
Diamondville	IVs	---	---	---	---	---
147:						
Cutback	VIe	---	---	---	---	---
Pinelli	IVe	---	---	---	---	---
148:						
Dahlquist	VIs	VIs	---	---	---	2.0
Rawlins	IVe	IVe	---	---	---	3.0
Browtine	VIs	VIs	---	---	---	2.0
149:						
Dalecreek	IVw	IVw	---	---	---	3.0
Kovich	Vw	Vw	---	---	---	2.0
150:						
Delphill	VIe	---	---	---	---	---
Blazon	VIIe	---	---	---	---	---
151:						
Diamondville	IVe	---	---	---	---	---
Cushool	IVe	---	---	---	---	---
152:						
Diamonkit	IVe	---	---	---	---	---
Stylite	IVe	---	---	---	---	---
153 Elkol	VIs	---	---	---	---	---
154*, 155*:						
Elkol	VIs	---	---	---	---	---
Gerdrum family	VIs	---	---	---	---	---
156 Evanston	IVe	---	---	---	---	---
157:						
Evanston	VIe	---	---	---	---	---

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability N	Land capability I	Alfalfa hay N	Alfalfa hay I	Grass hay N	Grass hay I
			Tons	Tons	Tons	Tons
157:						
Bonjea	VIIe	---	---	---	---	---
158:						
Fiveoh	IVe	---	---	---	---	---
Fiveoh, cobbly substratum	IVe	---	---	---	---	---
Ryan Park	IVe	---	---	---	---	---
159*:						
Fiveoh, cobbly substratum	IVe	---	---	---	---	---
Fiveoh	IVe	---	---	---	---	---
Urban land.						
160:						
Fiveoh, cobbly substratum	IVe	---	---	---	---	---
Joemre	IVe	---	---	---	---	---
161 Folavar	VIs	VIs	---	---	---	2
162:						
Folavar	VIs	VIs	---	---	---	2
Borollic Camborthids.	VIs	VIs				2
163 Forelle	IVe					
164*:						
Forelle	IVc	---	---	---	---	---
Urban land.						
165*:						
Forelle	IVe	---	---	---	---	---
Diamondville	IVe	---	---	---	---	---
166:						
Glendive	IVw	IVw	---	3.5	---	3.0
Redrob	IVw	IVw	---	3.0	---	2.0
Grenoble	VIs	VIs	---	2.5	---	1.5
167:						
Grenoble	VIs	VIs	---	2.5	---	1.5

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability N	Land capability I	Alfalfa hay N	Alfalfa hay I	Grass hay N	Grass hay I
			Tons	Tons	Tons	Tons
167:						
Gerrard------	VIw	VIw	---	1	---	1.0
168----------- Greyback	VIs	VIs	---	---	---	1.5
169----------- Gypla	VIIs	---	---	---	---	---
170*:						
Gypla--------	VIIs	---	---	---	---	---
Urban land.						
171:						
Hanson-------	VIe	---	---	---	---	---
Quander------	VIe	---	---	---	---	---
172:						
Hapjack------	VIIe	---	---	---	---	---
Rogert-------	VIIe	---	---	---	---	---
Amesmont-----	VIe	---	---	---	---	---
173:						
Ipson--------	VIe	---	---	---	---	---
Evanston-----	VIe	---	---	---	---	---
174, 175------ Joemre	IVe	---	---	---	---	---
176*:						
Kezar--------	VIe	---	---	---	---	---
Carbol-------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
177*:						
Kildor-------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
178:						
Kiltabar-----	VIIs	---	---	---	---	---
Tismid-------	VIs	---	---	---	---	---
179:						
Lakehelen----	VIe	---	---	---	---	---
Redfeather---	VIIe	---	---	---	---	---
Amesmont-----	VIe	---	---	---	---	---

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability N	Land capability I	Alfalfa hay N	Alfalfa hay I	Grass hay N	Grass hay I
			Tons	Tons	Tons	Tons
180----------- Leavitt	VIs	---	---	---	---	---
181:						
Leavitt------	VIIe	---	---	---	---	---
Granile------	VIIe	---	---	---	---	---
182:						
Leavitt------	VIe	---	---	---	---	---
Hanson-------	VIe	---	---	---	---	---
183:						
Leavitt------	VIIe	---	---	---	---	---
Quander------	VIIe	---	---	---	---	---
184----------- Luhon	IVe	---	---	---	---	---
185:						
Luvar--------	IVe	---	---	---	---	---
Stylite------	IVe	---	---	---	---	---
Diamonkit----	IVe	---	---	---	---	---
186:						
Lymanson loam	VIe	---	---	---	---	---
Lymanson cobbly loam-	VIe	---	---	---	---	---
187----------- Manada	IVw	IVw	---	---	---	2
188----------- McFadden	IVe	---	---	---	---	---
189*:						
Miracle------	VIe	---	---	---	---	---
Cheadle------	VIIe	---	---	---	---	---
190:						
Moyerson-----	VIIe	---	---	---	---	---
Kemmerer-----	VIe	---	---	---	---	---
191*:						
Nathale------	VIIe	---	---	---	---	---
Passcreek, cobbly subsoil-----	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability N	Land capability I	Alfalfa hay N	Alfalfa hay I	Grass hay N	Grass hay I
			Tons	Tons	Tons	Tons
192----------- Pahlow	VIs	VIs	---	---	---	1.5
193:						
Pilotpeak----	VIIe	---	---	---	---	---
Canwall------	VIe	---	---	---	---	---
194----------- Pinelli	IVe	---	---	---	---	---
195*.						
Pits, mine	VIIIs					
196*:						
Poin---------	VIIe	---	---	---	---	---
Bowen--------	VIe	---	---	---	---	---
Rock outcrop.	VIIIs					
197:						
Poposhia-----	IVe	---	---	---	---	---
Blazon-------	VIIs	---	---	---	---	---
198:						
Poposhia-----	IVe	---	---	---	---	---
Forelle------	IVe	---	---	---	---	---
199*:						
Poposhia-----	IVe	---	---	---	---	---
Chaperton----	IVe	---	---	---	---	---
200*:						
Rainbolt-----	VIe	---	---	---	---	---
Morset-------	VIe	---	---	---	---	---
201:						
Redfeather---	VIIe	---	---	---	---	---
Lakehelen----	VIIe	---	---	---	---	---
Rogert-------	VIIe	---	---	---	---	---
202----------- Redrob	IVw	IVw	---	3	---	2
203:						
Redrob, frequently flooded-----	VIw	VIw	---	3	---	2
Grenoble-----	VIs	VIs	---	2.5	---	1.5
Redrob-------	IVw	IVw	---	3	---	2

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability N	Land capability I	Alfalfa hay N	Alfalfa hay I	Grass hay N	Grass hay I
			Tons	Tons	Tons	Tons
204:						
Redrob, frequently flooded-----	VIw	VIw	---	3	---	2
Redrob-------	IVw	IVw	---	3	---	2
205*:						
Redrob, frequently flooded-----	VIw	---	---	---	---	---
Redrob-------	IVw	---	---	---	---	---
Urban land.						
206:						
Rentsac------	VIIs	---	---	---	---	---
Wycolo-------	IVe	---	---	---	---	---
207:						
Renvers------	VIIs	---	---	---	---	---
Chalkhill----	VIIs	---	---	---	---	---
208:						
Rimton-------	VIIe	---	---	---	---	---
Passcreek, cobbly subsoil-----	VIIe	---	---	---	---	---
Miracle------	VIIe	---	---	---	---	---
209*. Riverwash	VIII					
210:						
Rock outcrop.	VIIIs					
Bonjea-------	VIIe	---	---	---	---	---
211:						
Rock outcrop.	VIIIs					
Bruja--------	VIIe	---	---	---	---	---
Byrnie-------	VIIe	---	---	---	---	---
212:						
Rock outcrop.	VIIIs					
Cathedral----	VIIe	---	---	---	---	---
213:						
Rock outcrop.	VIIIs					
Cathedral----	VIIe	---	---	---	---	---

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability		Alfalfa hay		Grass hay	
	N	I	N	I	N	I
			Tons	Tons	Tons	Tons
213:						
Alderon------	VIIe	---	---	---	---	---
214:						
Rock outcrop.	VIIIs					
Pilotpeak----	VIIe	---	---	---	---	---
215:						
Rock outcrop.	VIIIs					
Rogert-------	VIIe	---	---	---	---	---
216----------- Rock River	IVe	IVe	---	---	---	3.0
217----------- Rock River	IVe	---	---	---	---	---
218*:						
Rock River---	IVe	---	---	---	---	---
Urban land.						
219*:						
Rogert-------	VIIe	---	---	---	---	---
Lakehelen----	VIe	---	---	---	---	---
Rock outcrop.	VIIIs					
220:						
Rogert-------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
Amesmont-----	VIe	---	---	---	---	---
221----------- Rohonda	IVe	---	---	---	---	---
222:						
Rohonda------	IVe	---	---	---	---	---
Tieside------	VIIs	---	---	---	---	---
223*:						
Rohonda------	IVe	---	---	---	---	---
Cheadle------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
224----------- Ryark	IVe	---	---	---	---	---
225:						
Shirleybasin-	IVe	---	---	---	---	---

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability		Alfalfa hay		Grass hay	
	N	I	N	I	N	I
			Tons	Tons	Tons	Tons
225:						
Twocabin	IVe	---	---	---	---	---
Lahtida	IVe	---	---	---	---	---
226 Silas	VIw	VIw	---	---	---	3.0
227:						
Silas, gravelly substratum	VIw	VIw	---	---	---	3.0
Vensora	VIw	VIw	---	---	---	2.5
228 Stunner	IVe	---	---	---	---	---
229:						
Stunner	IVe	---	---	---	---	---
Borollic Camborthids.	IVe					
230:						
Stunner	IVe	---	---	---	---	---
Tisworth	VIs	---	---	---	---	---
Blazon	VIIs	---	---	---	---	---
231*:						
Stunner	IVe	---	---	---	---	---
Urban land.						
232 Teeler	VIe	---	---	---	---	---
233:						
Thiel	VIe	---	---	---	---	---
Lymanson	VIe	---	---	---	---	---
Leavitt	VIe	---	---	---	---	---
234*:						
Tieside	VIIs	---	---	---	---	---
Pilotpeak	VIIs	---	---	---	---	---
Rock outcrop.	VIIIs					
235 Tismid	VIs	---	---	---	---	---
236*, 237*:						
Tisworth	VIs	---	---	---	---	---

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability		Alfalfa hay		Grass hay	
	N	I	N	I	N	I
			Tons	Tons	Tons	Tons
236*, 237*:						
Gerdrum family------	VIs	---	---	---	---	---
238:						
Tule---------	VIIs	---	---	---	---	---
Chalkville---	VIIs	---	---	---	---	---
239*:						
Tyzak--------	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					
240----------- Wycolo	IVe	---	---	---	---	---
241:						
Wycolo-------	IVe	---	---	---	---	---
Alcova-------	IVe	---	---	---	---	---
242*:						
Wycolo-------	IVe	---	---	---	---	---
Alcova-------	IVe	---	---	---	---	---
Urban land.						
243:						
Wycolo-------	IVe	---	---	---	---	---
Tieside------	VIIs	---	---	---	---	---
244*:						
Wycolo-------	VIe	---	---	---	---	---
Thermopolis--	VIIe	---	---	---	---	---
Rock outcrop.	VIIIs					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL

(Absence of an entry indicates that the map unit component was not rated)

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
100 Aberone	Severe: poor filter.	Moderate: runoff.
101 Abston	*Slight	Severe: runoff.
Bullock	*Slight	Severe: runoff.
102:		
Alcova	Moderate: low adsorption.	Moderate: runoff.
Borollic Camborthids.		
103:		
Alcova, shallow substratum	Moderate: low adsorption.	Moderate: runoff.
Lupinto	Moderate: low adsorption, poor filter.	Slight.
Dahlquist	Severe: poor filter.	Slight.
104:		
Alcova, calcareous subsoil	Moderate: low adsorption, poor filter.	Moderate: runoff.
Rock River	Moderate: low adsorption.	Slight.
105 Almy	Moderate: low adsorption.	Moderate: runoff.
106:		
Almy	Moderate: low adsorption.	Slight.
Urban land.		
107 Almy	Moderate: low adsorption.	Slight.
Tismid	Slight	Moderate: runoff.
108 Alogia	Moderate: wetness.	Slight.
109:		
Alogia	Moderate: wetness.	Slight.
Urban land.		

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
110 Anchutz	Moderate: low adsorption.	Moderate: runoff.
111:		
Ansel	Slight	Severe: runoff.
Granile	Moderate: low adsorption.	Severe: runoff.
112:		
Bateson	Moderate: low adsorption, poor filter.	Moderate: runoff.
Shirleybasin	Moderate: low adsorption.	Moderate: runoff.
113:		
Blackhall	Slight*	Severe: runoff.
Browtine, moist	Slight	Severe: runoff.
114:		
Blackhall	Slight*	Severe: runoff.
Satanka	Slight*	Moderate: runoff.
Rock outcrop.		
115:		
Blazon	Slight*	Severe: runoff.
Chaperton	Moderate*: low adsorption.	Moderate: runoff.
116:		
Blazon	Slight*	Severe: runoff.
Delphill	Slight*	Severe: runoff.
117:		
Bonjea	Slight*	Severe: runoff.
Chugcreek	Slight*	Moderate: runoff.
Rock outcrop.		
118:		
Bonjea	Slight*	Severe: runoff.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
118:		
Rock outcrop.		
Chugcreek	Slight*	Severe: runoff.
119:		
Bosler, wet substratum	Severe: wetness, poor filter.	Slight.
120:		
Bosler	Moderate: poor filter.	Moderate: runoff.
Borollic Camborthids.		
121:		
Bosler, wet substratum	Severe: wetness, poor filter.	Slight.
Urban land.		
122:		
Boyle	Slight*	Severe: runoff.
Alderon	Slight*	Severe: runoff.
Cathedral	Severe*: poor filter.	Severe: runoff.
123:		
Boyle	Slight*	Moderate: runoff.
Boyle, thin solum	Slight*	Moderate: runoff.
124:		
Boyle	Slight*	Severe: runoff.
Rock outcrop.		
125:		
Boyle	Slight*	Moderate: runoff.
Lininger	Moderate: low adsorption.	Moderate: runoff.
126 Browtine	Moderate: low adsorption.	Slight.
127:		
Browtine	Slight	Slight.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
127:		
Hilltoppe	Slight	Moderate: runoff.
128:		
Bruja	Slight*	Severe: runoff.
Canwall	Slight*	Severe: runoff.
Telecan	Slight	Moderate: runoff.
129:		
Buffork	Slight*	Severe: runoff.
Bucklon	Slight*	Severe: runoff.
130:		
Byrnie	Slight*	Severe: runoff.
Rock outcrop.		
Alcova	Slight	Moderate: runoff.
131.		
Calciborolls		
132 Canburn	Severe: wetness.	Severe: runoff.
133 Cantle	Severe: wetness.	Severe: flooding.
134:		
Carbol	Moderate: seepage.	Severe: runoff.
Rock outcrop.		
135:		
Carmody	Slight*	Severe: runoff.
Edlin	Slight	Severe: runoff.
136:		
Carmody	Moderate*: low adsorption.	Moderate: runoff.
Ryan Park	Moderate: low adsorption.	Moderate: runoff.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential-- leaching	Pesticide loss potential-- runoff
137:		
Cathedral	Severe*: poor filter.	Severe: runoff.
Spinekop	Moderate: low adsorption.	Moderate: runoff.
Rock outcrop.		
138 Center Creek	Moderate: wetness.	Slight.
139:		
Chaperton, moderately saline	Slight*	Moderate: runoff.
Blazon	Slight*	Severe: runoff.
140:		
Chaperton	Slight*	Severe: runoff.
Poposhia	Slight	Severe: runoff.
141:		
Cheadle	Slight*	Severe: runoff.
Passcreek, cobbly subsoil	Slight*	Severe: runoff.
Rock outcrop.		
142:		
Cheadle	Slight*	Severe: runoff.
Rock outcrop.		
Miracle	Slight	Severe: runoff.
143 Cryaquolls	Severe: wetness, poor filter.	Severe: flooding.
144. Cryoborolls		
145:		
Cusholl	Moderate*: low adsorption.	Moderate: runoff.
Cutback	Moderate*: low adsorption.	Moderate: runoff.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential-- leaching	Pesticide loss potential-- runoff
146:		
Cushool	Moderate*: low adsorption.	Slight.
Diamondville	Slight*	Slight.
147:		
Cutback	Severe*: poor filter.	Moderate: runoff.
Pinelli	Moderate: low adsorption.	Moderate: runoff.
148:		
Dahlquist	Severe: poor filter.	Slight.
Rawlins	Moderate: low adsorption.	Moderate: runoff.
Browtine	Slight	Moderate: runoff.
149:		
Dalecreek	Moderate: wetness.	Moderate: runoff.
Kovich	Severe: wetness.	Moderate: flooding.
150:		
Delphill	Slight*	Moderate: runoff.
Blazon	Slight*	Severe: runoff.
151:		
Diamondville	Slight*	Moderate: runoff.
Cushool	Moderate: low adsorption.	Moderate: runoff.
152:		
Diamonkit	Slight	Moderate: runoff.
Stylite	Slight	Moderate: runoff.
153 Elkol	Slight	Severe: runoff.
154:		
Elkol	Slight	Severe: runoff.
Gerdrum Family	Slight	Severe: runoff.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
155:		
Elkol	Slight	Slight.
Gerdrum Family	Moderate: wetness.	Slight.
156 Evanston	Slight	Moderate: runoff.
157:		
Evanston	Slight	Severe: runoff.
Bonjea	Slight*	Severe: runoff.
158:		
Fiveoh	Slight	Moderate: runoff.
Fiveoh, cobbly substratum	Moderate: low adsorption, poor filter.	Moderate: runoff.
Ryan Park	Moderate: low adsorption.	Moderate: runoff.
159:		
Fiveoh, cobbly substratum	Moderate: low adsorption, poor filter.	Moderate: runoff.
Fiveoh	Slight	Moderate: runoff.
Urban land.		
160:		
Fiveoh, cobbly substratum	Moderate: low adsorption, poor filter.	Moderate: runoff.
Joemre	Slight	Moderate: runoff.
161 Folavar	Severe: wetness, poor filter.	Slight.
162:		
Folavar	Severe: wetness, poor filter.	Slight.
Borollic Camborthids.		
163 Forelle	Moderate: low adsorption.	Moderate: runoff.
164:		
Forelle	Slight	Slight.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
164:		
Urban land.		
165:		
Forelle	Slight	Moderate: runoff.
Diamondville	Slight*	Moderate: runoff.
166:		
Glendive	Moderate: low adsorption, wetness.	Slight.
Redrob	Severe: wetness.	Slight.
Grenoble	Severe: poor filter.	Severe: flooding.
167:		
Grenoble	Severe: poor filter.	Severe: flooding.
Gerrard	Severe: wetness, poor filter.	Severe: flooding.
168 Greyback	Severe: poor filter.	Slight.
169 Gypla	Severe: wetness.	Slight.
170:		
Gypla	Severe: wetness.	Slight.
Urban land.		
171:		
Hanson	Moderate: low adsorption.	Moderate: runoff.
Quander	Moderate: low adsorption.	Moderate: runoff.
172:		
Hapjack	Slight*	Severe: runoff.
Rogert	Slight*	Severe: runoff.
Amesmont	Slight*	Moderate: runoff.
173:		
Ipson	Slight	Severe: runoff.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
173:		
Evanston	Slight	Severe: runoff.
174 Joemre	Moderate: low adsorption.	Moderate: runoff.
175 Joemre	Moderate: low adsorption.	Moderate: runoff.
176:		
Kezar	Slight	Severe: runoff.
Carbol	Moderate: seepage.	Severe: runoff.
Rock outcrop.		
177:		
Kildor	Slight*	Severe: runoff.
Rock outcrop.		
178:		
Kiltabar	Moderate: wetness.	Slight.
Tismid	Slight	Slight.
179:		
Lakehelen	Slight*	Moderate: runoff.
Redfeather	Slight*	Moderate: runoff.
Amesmont	Severe*: poor filter.	Moderate: runoff.
180 Leavitt	Moderate: low adsorption.	Moderate: runoff.
181:		
Leavitt	Slight	Severe: runoff.
Granile	Slight*	Severe: runoff.
182:		
Leavitt	Slight	Severe: runoff.
Hanson	Moderate: low adsorption.	Moderate: runoff.
183:		
Leavitt	Slight	Severe: runoff.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
183:		
Quander	Slight	Severe: runoff.
184 Luhon	Slight	Moderate: runoff.
185:		
Luvar	Moderate: low adsorption.	Moderate: runoff.
Stylite	Slight	Moderate: runoff.
Diamonkit	Slight*	Moderate: runoff.
186:		
Lymanson loam	Moderate*: low adsorption.	Moderate: runoff.
Lymanson cobbly loam	Moderate*: low adsorption.	Moderate: runoff.
187 Manada	Moderate: wetness.	Moderate: runoff.
188 Mcfadden	Slight	Slight.
189:		
Miracle	Moderate: low adsorption.	Moderate: runoff.
Cheadle	Slight*	Severe: runoff.
190 Moyerson	Slight*	Severe: runoff.
Kemmerer	Slight*	Moderate: runoff.
191:		
Nathale	Slight*	Severe: runoff.
Passcreek, cobbly subsoil	Slight*	Severe: runoff.
Rock outcrop.		
192 Pahlow	Severe: poor filter.	Slight.
193:		
Pilotpeak	Slight*	Moderate: runoff.
Canwall	Slight*	Moderate: runoff.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
194: Pinelli	Slight*	Moderate: runoff.
195. Pits, mine		
196:		
Poin	Slight*	Severe: runoff.
Bowen	Slight*	Severe: runoff.
Rock outcrop.		
197:		
Poposhia	Moderate: low adsorption.	Moderate: runoff.
Blazon	Slight*	Severe: runoff.
198:		
Poposhia	Moderate: low adsorption.	Moderate: runoff.
Forelle	Moderate: low adsorption.	Moderate: runoff.
199:		
Poposhia	Slight	Moderate: runoff.
Chaperton	Moderate*: low adsorption.	Moderate: runoff.
200:		
Rainbolt	Slight*	Moderate: runoff.
Morset	Severe: low adsorption.	Moderate: runoff.
201:		
Redfeather	Slight*	Severe: runoff.
Lakehelen	Slight*	Severe: runoff.
Rogert	Slight*	Severe: runoff.
202: Redrob	Severe: wetness.	Slight.
203:		
Redrob, frequently flooded	Severe: wetness, poor filter.	Severe: flooding.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
203:		
Grenoble	Severe: poor filter.	Severe: flooding.
Redrob	Severe: wetness.	Slight.
204:		
Redrob, frequently flooded	Severe: wetness.	Severe: flooding.
Redrob	Severe: wetness.	Severe: runoff.
205:		
Redrob, frequently flooded	Severe: wetness, poor filter.	Severe: flooding.
Redrob	Severe: wetness.	Slight.
Urban land.		
206:		
Rentsac	Slight*	Moderate: runoff.
Wycolo	Slight*	Moderate: runoff.
207:		
Renvers	Slight*	Moderate: runoff.
Chalkhill	Slight*	Moderate: runoff.
208:		
Rimton	Slight*	Severe: runoff.
Passcreek, cobbly subsoil	Slight*	Severe: runoff.
Miracle	Slight	Severe: runoff.
209.		
Riverwash		
210:		
Rock outcrop.		
Bonjea	Slight*	Severe: runoff.
211:		
Rock outcrop.		

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
211:		
Bruja	Slight*	Severe: runoff.
Byrnie	Slight*	Severe: runoff.
212:		
Rock outcrop.		
Cathedral	Severe*: poor filter.	Severe: runoff.
213:		
Rock outcrop.		
Cathedral	Severe*: poor filter.	Severe: runoff.
Alderon	Moderate*: low adsorption.	Severe: runoff.
214:		
Rock outcrop.		
Pilotpeak	Slight*	Moderate: runoff.
215:		
Rock outcrop.		
Rogert	Slight*	Severe: runoff.
216 Rock River	Moderate: low adsorption.	Moderate: runoff.
217 Rock River	Moderate: low adsorption.	Moderate: runoff.
218:		
Rock River	Moderate: low adsorption.	Moderate: runoff.
Urban land.		
219:		
Rogert	Slight*	Severe: runoff.
Lakehelen	Slight*	Severe: runoff.
Rock outcrop.		
220:		
Rogert	Slight*	Severe: runoff.
Rock outcrop.		

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
220:		
Amesmont	Severe*: poor filter.	Moderate: runoff.
221 Rohonda	Slight*	Moderate: runoff.
222:		
Rohonda	Slight*	Moderate: runoff.
Tieside	Slight*	Moderate: runoff.
223:		
Rohonda	Slight*	Moderate: runoff.
Cheadle	Slight*	Severe: runoff.
Rock outcrop.		
224 Ryark	Moderate: low adsorption.	Slight.
225:		
Shirleybasin	Moderate: low adsorption.	Moderate: runoff.
Twocabin	Moderate: low adsorption.	Moderate: runoff.
Lahtida	Slight*	Moderate: runoff.
226 Silas	Moderate: wetness.	Moderate: runoff.
227:		
Silas, gravelly substratum	Moderate: wetness.	Moderate: runoff.
Vensora	Severe: wetness.	Slight.
228 Stunner	Moderate: low adsorption.	Moderate: runoff.
229:		
Stunner	Moderate: low adsorption.	Moderate: runoff.
Borollic Camborthids.		
230:		
Stunner	Moderate: low adsorption.	Moderate: runoff.
Tisworth	Slight	Moderate: runoff.

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
230:		
Blazon	Slight*	Severe: runoff.
231:		
Stunner	Moderate: low adsorption.	Moderate: runoff.
Urban land.		
232:		
Teeler	Slight	Severe: runoff.
233:		
Thiel	Severe: poor filter.	Moderate: runoff.
Lymanson	Slight*	Moderate: runoff.
234:		
Tieside	Slight*	Severe: runoff.
Pilotpeak	Slight*	Moderate: runoff.
Rock outcrop.		
235 Tismid	Slight	Moderate: runoff.
236:		
Tisworth	Slight	Moderate: runoff.
Gerdrum Family	Slight	Severe: runoff.
237:		
Tisworth	Slight	Moderate: runoff.
Gerdrum Family	Slight	Severe: runoff.
238:		
Tule	Slight*	Moderate: runoff.
Chalkville	Slight*	Severe: runoff.
239:		
Tyzak	Slight*	Severe: runoff.
Rock outcrop.		

See footnote at end of table.

TABLE 6.--SOIL-PESTICIDE LOSS POTENTIAL--Continued

Soil name and map symbol	Pesticide loss potential--leaching	Pesticide loss potential--runoff
240 Wycolo	Moderate*: low adsorption.	Moderate: runoff.
241:		
Wycolo	Slight*	Moderate: runoff.
Alcova	Slight	Moderate: runoff.
242:		
Wycolo	Slight*	Moderate: runoff.
Alcova	Slight	Slight.
Urban land.		
243:		
Wycolo	Moderate*: low adsorption.	Moderate: runoff.
Tieside	Slight*	Severe: runoff.
244:		
Wycolo	Slight*	Severe: runoff.
Thermopolis	Slight*	Severe: runoff.
Rock outcrop.		

* Bedrock permeability criteria were not evaluated because data were not available.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES

(Only the soils that support rangeland vegetation suitable for grazing are listed)

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
100 Aberone	Shallow Sandy, 12-14 Southern Plains.	Favorable	1,300	Needleandthread	25
		Normal	1,000	Prairie sandreed	15
		Unfavorable	600	Blue grama	10
				Sand bluestem	10
				Threadleaf sedge	10
				Indian ricegrass	5
				Yucca	5
101*: Abston	Impervious Clay, 10-14 High Plains Southeast.	Favorable	700	Birdfoot sagebrush	25
		Normal	500	Western wheatgrass	20
		Unfavorable	350	Indian ricegrass	10
				Bottlebrush squirreltail	10
				Gardner saltbush	10
				Sandberg bluegrass	5
				Low rabbitbrush	5
Bullock	Saline Loamy, 10-14 High Plains Southeast.	Favorable	900	Western wheatgrass	25
		Normal	700	Birdfoot sagebrush	15
		Unfavorable	500	Gardner saltbush	15
				Bluebunch wheatgrass	10
				Needleandthread	10
				Big sagebrush	10
				Sandberg bluegrass	5
				Threadleaf sedge	5
102*: Alcova	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	35
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Mutton bluegrass	5
				Green needlegrass	5
Borollic Camborthids	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	30
		Normal	1,200	Thickspike wheatgrass	20
		Unfavorable	700	Indian ricegrass	15
				Threadleaf sedge	10
				Silver sagebrush	10
103*: Alcova, shallow substratum	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Western wheatgrass	20
		Unfavorable	700	Mutton bluegrass	10
				Needleandthread	10
				Black sagebrush	10
				Fringed sagewort	5
Lupinto	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Western wheatgrass	20
		Unfavorable	700	Mutton bluegrass	10
				Needleandthread	10
				Black sagebrush	10
				Fringed sagewort	5
				Big sagebrush	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
103*:					
Dahlquist----------	Coarse Upland, 10-14 High Plains Southeast.	Favorable	1,400	Bluebunch wheatgrass----------	15
		Normal	1,000	Little bluestem---------------	15
		Unfavorable	600	Western wheatgrass------------	10
				Black sagebrush---------------	10
				Mutton bluegrass--------------	5
				Prairie junegrass-------------	5
				Threadleaf sedge--------------	5
				Hood phlox--------------------	5
				Fringed sagewort--------------	5
				Big sagebrush-----------------	5
104*:					
Alcova, calcareous subsoil----------	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	20
		Normal	900	Western wheatgrass------------	20
		Unfavorable	700	Mutton bluegrass--------------	10
				Needleandthread---------------	10
				Black sagebrush---------------	10
				Fringed sagewort--------------	5
Rock River--------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Mutton bluegrass--------------	5
				Green needlegrass-------------	5
				Low rabbitbrush---------------	5
105--------------- Almy	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Green needlegrass-------------	5
				Prairie junegrass-------------	5
				Fringed sagewort--------------	5
				Douglas rabbitbrush-----------	5
107*:					
Almy--------------	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	20
		Normal	900	Western wheatgrass------------	15
		Unfavorable	700	Needleandthread---------------	10
				Black sagebrush---------------	10
				Prairie junegrass-------------	5
				Fringed sagewort--------------	5
				Blue grama--------------------	5
Tismid------------	Impervious Clay, 10-14 High Plains Southeast.	Favorable	700	Western wheatgrass------------	25
		Normal	500	Birdfoot sagebrush------------	25
		Unfavorable	350	Bottlebrush squirreltail------	10
				Indian ricegrass--------------	10
				Gardner saltbush--------------	10
				Hood phlox--------------------	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
108------------- Alogia	Saline Lowland, 10-14 High Plains Southeast.	Favorable	2,500	Alkali sacaton	30
		Normal	1,800	Basin wildrye	10
		Unfavorable	1,200	Western wheatgrass	10
				Inland saltgrass	10
				Greasewood	10
				Indian ricegrass	5
				Threadleaf sedge	5
				Fourwing saltbush	5
				Rubber rabbitbrush	5
110------------- Anchutz	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	15
		Normal	900	Western wheatgrass	15
		Unfavorable	700	Needleandthread	10
				Black sagebrush	10
				Mutton bluegrass	5
				Blue grama	5
				Prairie junegrass	5
				Sandberg bluegrass	5
				Hood phlox	5
				Fringed sagewort	5
				Winterfat	5
112*:					
Bateson----------	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Western wheatgrass	20
		Unfavorable	700	Mutton bluegrass	10
				Needleandthread	10
				Black sagebrush	10
				Fringed sagewort	5
Shirleybasin------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Mutton bluegrass	5
				Green needlegrass	5
				Low rabbitbrush	5
113*:					
Blackhall---------	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Indian ricegrass	10
		Unfavorable	700	Needleandthread	10
				Prairie junegrass	5
				Western wheatgrass	5
				Black sagebrush	5
				Threadleaf sedge	5
				Blue grama	5
Browtine, moist---	Coarse Upland, 15-19 Foothills And Mountains Southeast.	Favorable	1,700	Bluebunch wheatgrass	20
		Normal	1,300	Idaho fescue	10
		Unfavorable	800	Western wheatgrass	10
				Threetip sagebrush	10
				Indian ricegrass	5
				Needleandthread	5
				Prairie junegrass	5
				Mountain muhly	5
				Parry danthonia	5
				Hood phlox	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
114*:					
Blackhall	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Indian ricegrass	10
		Unfavorable	700	Needleandthread	10
				Prairie junegrass	5
				Western wheatgrass	5
				Black sagebrush	5
				Threadleaf sedge	5
				Blue grama	5
Satanka	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	30
		Normal	1,200	Thickspike wheatgrass	20
		Unfavorable	700	Indian ricegrass	15
				Threadleaf sedge	10
				Silver sagebrush	10
				Bottlebrush squirreltail	5
Rock outcrop.					
115*:					
Blazon	Shallow Loamy, 15-17 Southern Plains.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Green needlegrass	20
		Unfavorable	600	Bluebunch wheatgrass	10
				Winterfat	10
				Blue grama	10
Chaperton	Clayey, 15-17 Southern Plains.	Favorable	1,700	Western wheatgrass	40
		Normal	1,300	Green needlegrass	25
		Unfavorable	600	Winterfat	10
				Blue grama	5
116*:					
Blazon	Shallow Clayey, 10-14 High Plains Southeast.	Favorable	1,000	Western wheatgrass	40
		Normal	800	Bluebunch wheatgrass	10
		Unfavorable	500	Winterfat	10
				Mutton bluegrass	10
				Bottlebrush squirreltail	10
Delphill	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Green needlegrass	5
				Mutton bluegrass	5
117*:					
Bonjea	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	10
				Idaho fescue	5
				Needleandthread	5
				Western wheatgrass	5
				Indian ricegrass	5
				Sandberg bluegrass	5
				Fringed sagewort	5
				Antelope bitterbrush	5
				Mountainmahogany	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo- sition
			Lb/acre		Pct
117*:					
Chugcreek---------	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	15
		Normal	1,500	Idaho fescue------------------	10
		Unfavorable	800	Prairie junegrass-------------	10
				Griffith wheatgrass-----------	10
				Big sagebrush-----------------	10
				Canby bluegrass---------------	5
				Columbia needlegrass----------	5
				Mountain brome----------------	5
				Parry danthonia---------------	5
				Threetip sagebrush------------	5
Rock outcrop.					
118*:					
Bonjea------------	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	20
		Normal	900	Slimstem muhly----------------	15
		Unfavorable	600	Threetip sagebrush------------	10
				Idaho fescue------------------	5
				Needleandthread---------------	5
				Western wheatgrass------------	5
				Indian ricegrass--------------	5
				Sandberg bluegrass------------	5
				Fringed sagewort--------------	5
				Antelope bitterbrush----------	5
				Mountainmahogany--------------	5
Rock outcrop.					
Chugcreek---------	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	15
		Normal	1,500	Idaho fescue------------------	10
		Unfavorable	800	Prairie junegrass-------------	10
				Griffith wheatgrass-----------	10
				Big sagebrush-----------------	10
				Canby bluegrass---------------	5
				Columbia needlegrass----------	5
				Mountain brome----------------	5
				Parry danthonia---------------	5
				Threetip sagebrush------------	5
119---------------- Bosler, wet substratum	Saline Lowland, 10-14 High Plains Southeast.	Favorable	2,500	Alkali sacaton----------------	30
		Normal	1,800	Basin wildrye-----------------	15
		Unfavorable	1,200	Black greasewood--------------	15
				Western wheatgrass------------	10
				Inland saltgrass--------------	5
				Milkvetch---------------------	5
				Rubber rabbitbrush------------	5
120*:					
Bosler------------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Big sagebrush-----------------	10
				Bluebunch wheatgrass----------	10
				Green needlegrass-------------	5
				Mutton bluegrass--------------	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
120*:					
Borollic Camborthids	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	30
		Normal	1,200	Thickspike wheatgrass	20
		Unfavorable	700	Indian ricegrass	15
				Threadleaf sedge	10
				Silver sagebrush	10
122*:					
Boyle	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	25
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	15
				Idaho fescue	5
				Griffith wheatgrass	5
				Western wheatgrass	5
				Winterfat	5
Alderon.					
Cathedral	Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	700	Bluebunch wheatgrass	35
		Normal	550	Slimstem muhly	15
		Unfavorable	350	Black sagebrush	10
				Threetip sagebrush	10
				Idaho fescue	5
				Griffith wheatgrass	5
123*:					
Boyle	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	25
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	15
				Idaho fescue	5
				Griffith wheatgrass	5
				Western wheatgrass	5
				Winterfat	5
Boyle, thin solum	Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	700	Bluebunch wheatgrass	35
		Normal	550	Slimstem muhly	15
		Unfavorable	350	Threetip sagebrush	10
				Black sagebrush	10
				Idaho fescue	5
				Griffith wheatgrass	5
124*:					
Boyle	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	25
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	15
				Idaho fescue	5
				Griffith wheatgrass	5
				Western wheatgrass	5
				Winterfat	5
Rock outcrop.					

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
125*:					
Boyle	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	25
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	15
				Idaho fescue	5
				Griffith wheatgrass	5
				Western wheatgrass	5
				Winterfat	5
Lininger	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	25
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	10
				Idaho fescue	5
				Griffith wheatgrass	5
				Western wheatgrass	5
126 Browtine	Gravelly, 10-14 High Plains Southeast.	Favorable	650	Bluebunch wheatgrass	40
		Normal	450	Indian ricegrass	10
		Unfavorable	300	Needleandthread	10
				Prairie junegrass	10
				Hood phlox	5
				Needleleaf sedge	5
				Low rabbitbrush	5
127*:					
Browtine	Gravelly, 10-14 High Plains Southeast.	Favorable	650	Bluebunch wheatgrass	40
		Normal	450	Indian ricegrass	10
		Unfavorable	300	Needleandthread	10
				Prairie junegrass	10
				Hood phlox	5
				Needleleaf sedge	5
				Low rabbitbrush	5
Hilltoppe	Very Shallow, 10-14 High Plains Southeast.	Favorable	600	Bluebunch wheatgrass	40
		Normal	450	Western wheatgrass	10
		Unfavorable	250	Bottlebrush squirreltail	10
				Black sagebrush	5
				Antelope bitterbrush	5
128*:					
Bruja	Rocky Hills, 10-14 High Plains Southeast.	Favorable	800	Mountainmahogany	40
		Normal	600	Bluebunch wheatgrass	25
		Unfavorable	350	Western wheatgrass	15
				Needleandthread	15
Canwall	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Indian ricegrass	10
		Unfavorable	700	Needleandthread	10
				Western wheatgrass	5
				Sandberg bluegrass	5
				Mountainmahogany	5
				Black sagebrush	5
Telecan	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	30
		Normal	1,200	Thickspike wheatgrass	20
		Unfavorable	700	Indian ricegrass	15
				Threadleaf sedge	10
				Silver sagebrush	10
				Bottlebrush squirreltail	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
129*:					
Buffork-----------	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	20
		Normal	1,500	Idaho fescue------------------	20
		Unfavorable	800	Prairie junegrass-------------	10
				Griffith wheatgrass-----------	10
				Big sagebrush-----------------	5
				Threetip sagebrush------------	5
Bucklon-----------	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass----------	35
		Normal	1,100	Griffith wheatgrass-----------	15
		Unfavorable	800	Slimstem muhly----------------	5
				Idaho fescue------------------	5
				Threetip sagebrush------------	5
				Black sagebrush---------------	5
130*:					
Byrnie------------	Rocky Hills, 10-14 High Plains Southeast.	Favorable	800	True mountainmahogany---------	40
		Normal	600	Bluebunch wheatgrass----------	25
		Unfavorable	350	Needleandthread---------------	15
				Western wheatgrass------------	15
Rock outcrop.					
131---------------- Calciborolls	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton----------------	40
		Normal	3,000	Basin wildrye-----------------	20
		Unfavorable	2,500	Alkali bluegrass--------------	10
132---------------- Canburn	Subirrigated, 10-14 High Plains Southeast.	Favorable	4,300	Basin wildrye-----------------	35
		Normal	3,700	Tufted hairgrass--------------	15
		Unfavorable	3,000	Western wheatgrass------------	10
				Slender wheatgrass------------	5
				Alkali sacaton----------------	5
				Canby bluegrass---------------	5
				Arrow-grass-------------------	5
				Iris--------------------------	5
				Willow------------------------	5
133---------------- Cantle	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton----------------	40
		Normal	3,000	Basin wildrye-----------------	20
		Unfavorable	2,500	Alkali bluegrass--------------	10
				Inland saltgrass--------------	5
				Arrow-grass-------------------	5
				Greasewood--------------------	5
134*:					
Carbol------------	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	20
		Normal	900	Slimstem muhly----------------	15
		Unfavorable	600	Threetip sagebrush------------	10
				Idaho fescue------------------	5
				Needleandthread---------------	5
				Griffith wheatgrass-----------	5
				Western wheatgrass------------	5
				Mountain muhly----------------	5
				Sandberg bluegrass------------	5
				Threadleaf sedge--------------	5
				Wyoming big sagebrush---------	5
Rock outcrop.					

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight		
			Lb/acre		Pct
135*:					
Carmody	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Needleandthread	15
		Unfavorable	700	Indian ricegrass	10
				Mutton bluegrass	10
				Prairie junegrass	5
				Sandberg bluegrass	5
				Winterfat	5
				Western wheatgrass	5
				Fringed sagewort	5
				Black sagebrush	5
Edlin	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Needleandthread	15
		Unfavorable	700	Indian ricegrass	10
				Mutton bluegrass	10
				Prairie junegrass	5
				Sandberg bluegrass	5
				Western wheatgrass	5
				Winterfat	5
				Fringed sagewort	5
				Black sagebrush	5
136*:					
Carmody	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	25
		Normal	1,200	Thickspike wheatgrass	20
		Unfavorable	700	Indian ricegrass	15
				Threadleaf sedge	10
				Silver sagebrush	10
				Prairie junegrass	5
				Sandberg bluegrass	5
				Winterfat	5
Ryan Park	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	30
		Normal	1,200	Thickspike wheatgrass	20
		Unfavorable	700	Indian ricegrass	15
				Threadleaf sedge	10
				Silver sagebrush	10
				Bottlebrush squirreltail	5
137*:					
Cathedral	Very Shallow, 12-14 Southern Plains.	Favorable	900	Bluebunch wheatgrass	25
		Normal	600	Needleandthread	15
		Unfavorable	300	Little bluestem	15
				Blue grama	10
				Western wheatgrass	5
				Threadleaf sedge	5
Spinekop	Loamy, 12-14 Southern Plains.	Favorable	1,800	Western wheatgrass	20
		Normal	1,300	Needleandthread	20
		Unfavorable	600	Blue grama	10
				Big sagebrush	5
				Threadleaf sedge	5
Rock outcrop.					

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
138 Center Creek	Subirrigated, 10-14 High Plains Southeast.	Favorable	4,300	Basin wildrye	40
		Normal	3,700	Tufted hairgrass	20
		Unfavorable	3,000	Western wheatgrass	10
				Slender wheatgrass	5
				Willow	5
				Shrubby cinquefoil	5
139*:					
Chaperton, moderately saline	Saline Loamy, 10-14 High Plains Southeast.	Favorable	900	Western wheatgrass	25
		Normal	700	Needleandthread	15
		Unfavorable	500	Birdfoot sagebrush	15
				Gardner saltbush	15
				Bluebunch wheatgrass	10
				Big sagebrush	10
Blazon	Shallow Clayey, 10-14 High Plains Southeast.	Favorable	1,000	Western wheatgrass	40
		Normal	800	Bluebunch wheatgrass	10
		Unfavorable	500	Winterfat	10
				Mutton bluegrass	10
				Bottlebrush squirreltail	10
140*:					
Chaperton	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Western wheatgrass	20
		Normal	900	Bluebunch wheatgrass	20
		Unfavorable	700	Needleandthread	10
				Black sagebrush	10
				Mutton bluegrass	5
				Prairie junegrass	5
				Threadleaf sedge	5
				Hood phlox	5
				Fringed sagewort	5
				Winterfat	5
Poposhia	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Western wheatgrass	20
		Normal	900	Bluebunch wheatgrass	20
		Unfavorable	700	Needleandthread	10
				Black sagebrush	10
				Mutton bluegrass	5
				Big sagebrush	5
				Low rabbitbrush	5
				Green needlegrass	5
				Fringed sagewort	5
141*:					
Cheadle	Rocky Hills, 15-19 Foothills And Mountains Southeast.	Favorable	1,150	True mountainmahogany	30
		Normal	900	Bluebunch wheatgrass	20
		Unfavorable	550	Needleandthread	15
				Spike fescue	15
				Antelope bitterbrush	10
Passcreek, cobbly subsoil	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass	20
		Normal	1,500	Idaho fescue	20
		Unfavorable	800	Prairie junegrass	10
				Big sagebrush	5
				Threetip sagebrush	5
Rock outcrop.					

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
142*:					
Cheadle----------	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass----------	30
		Normal	1,100	Parry danthonia---------------	15
		Unfavorable	800	Threetip sagebrush------------	5
				Black sagebrush---------------	5
Rock outcrop.					
Miracle----------	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	20
		Normal	1,500	Idaho fescue------------------	20
		Unfavorable	800	Prairie junegrass-------------	10
				Griffith wheatgrass-----------	10
				Big sagebrush-----------------	5
				Threetip sagebrush------------	5
143--------------- Cryaquolls	Wetland, 15-19 Foothills And Mountains Southeast.	Favorable	6,500	Tufted hairgrass--------------	30
		Normal	5,500	Nebraska sedge----------------	15
		Unfavorable	4,000	Slough sedge------------------	10
				Willows-----------------------	10
145*:					
Cushool----------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	10
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Sandberg bluegrass------------	5
				Prairie junegrass-------------	5
				Hood phlox--------------------	5
				Fringed sagewort--------------	5
Cutback----------	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	20
		Normal	900	Western wheatgrass------------	20
		Unfavorable	700	Needleandthread---------------	10
				Mutton bluegrass--------------	10
				Black sagebrush---------------	10
				Green needlegrass-------------	5
				Prairie junegrass-------------	5
				Sandberg bluegrass------------	5
				Winterfat---------------------	5
146*:					
Cushool----------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	10
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Sandberg bluegrass------------	5
				Prairie junegrass-------------	5
				Hood phlox--------------------	5
				Fringed sagewort--------------	5
Diamondville------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Green needlegrass-------------	5
				Blue grama--------------------	5
				Threadleaf sedge--------------	5
				Fringed sagewort--------------	5
				Douglas rabbitbrush-----------	5
				Prairie junegrass-------------	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
147*:					
Cutback	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Western wheatgrass	20
		Unfavorable	700	Needleandthread	10
				Mutton bluegrass	10
				Black sagebrush	10
				Green needlegrass	5
				Prairie junegrass	5
				Sandberg bluegrass	5
				Winterfat	5
Pinelli	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Bluebunch wheatgrass	10
		Unfavorable	600	Big sagebrush	10
				Green needlegrass	5
				Mutton bluegrass	5
				Douglas rabbitbrush	5
148*:					
Dahlquist	Coarse Upland, 15-19 Foothills And Mountains Southeast.	Favorable	1,700	Bluebunch wheatgrass	25
		Normal	1,300	Idaho fescue	15
		Unfavorable	800	Western wheatgrass	10
				Prairie junegrass	10
				Threadleaf sedge	5
				Fringed sagewort	5
				Big sagebrush	5
				Spike fescue	5
				Needleandthread	5
				Antelope bitterbrush	5
Rawlins	Coarse Upland, 15-19 Foothills And Mountains Southeast.	Favorable	1,700	Bluebunch wheatgrass	30
		Normal	1,300	Idaho fescue	20
		Unfavorable	800	Western wheatgrass	10
				Prairie junegrass	10
				Needleandthread	5
				Big sagebrush	5
Browtine	Coarse Upland, 15-19 Foothills And Mountains Southeast.	Favorable	1,700	Bluebunch wheatgrass	30
		Normal	1,300	Idaho fescue	20
		Unfavorable	800	Western wheatgrass	10
				Prairie junegrass	10
				Needleandthread	5
				Big sagebrush	5
149*:					
Dalecreek	Subirrigated, 15-19 Foothills And Mountains Southeast.	Favorable	4,500	Basin wildrye	30
		Normal	4,000	Western wheatgrass	10
		Unfavorable	3,300	Tufted hairgrass	10
				Slender wheatgrass	10
				Nebraska sedge	5
				Willow	5
Kovich	Wetland, 15-19 Foothills And Mountains Southeast.	Favorable	6,500	Tufted hairgrass	30
		Normal	5,500	Nebraska sedge	15
		Unfavorable	4,000	Willow	15
				Slough sedge	10

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo- sition
			Lb/acre		Pct
150*:					
Delphill	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Green needlegrass	5
				Mutton bluegrass	5
Blazon	Shallow Clayey, 10-14 High Plains Southeast.	Favorable	1,000	Western wheatgrass	40
		Normal	800	Bluebunch wheatgrass	10
		Unfavorable	500	Winterfat	10
				Mutton bluegrass	10
				Bottlebrush squirreltail	10
151*:					
Diamondville	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Green needlegrass	5
				Blue grama	5
				Threadleaf sedge	5
				Fringed sagewort	5
				Douglas rabbitbrush	5
				Prairie junegrass	5
Cushool	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	20
		Normal	1,200	Thickspike wheatgrass	15
		Unfavorable	700	Indian ricegrass	10
				Bluebunch wheatgrass	5
				Sandberg bluegrass	5
				Prairie junegrass	5
				Hood phlox	5
				Fringed sagewort	5
				Silver sagebrush	5
				Big sagebrush	5
152*:					
Diamonkit	Shallow-Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	15
		Normal	900	Western wheatgrass	10
		Unfavorable	700	Needleandthread	10
				Mutton bluegrass	10
				Black sagebrush	10
				Green needlegrass	5
				Indian ricegrass	5
				Squirreltail	5
				Blue grama	5
				Prairie junegrass	5
				Sandberg bluegrass	5
				Threadleaf sedge	5
				Threetip sagebrush	5
Stylite	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Green needlegrass	5
				Mutton bluegrass	5
				Low rabbitbrush	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
153 Elkol	Saline Upland, 10-14 High Plains Southeast.	Favorable	650	Gardner saltbush	40
		Normal	500	Western wheatgrass	15
		Unfavorable	300	Indian ricegrass	15
				Bottlebrush squirreltail	15
				Black greasewood	5
				Birdfoot sagebrush	5
154*:					
Elkol	Saline Lowland, 10-14 High Plains Southeast.	Favorable	2,500	Alkali sacaton	30
		Normal	1,800	Basin wildrye	15
		Unfavorable	1,200	Western wheatgrass	10
				Black greasewood	10
				Inland saltgrass	10
				Gardner saltbush	5
				Rubber rabbitbrush	5
Gerdrum Family	Saline Upland, 10-14 High Plains Southeast.	Favorable	650	Gardner saltbush	40
		Normal	500	Western wheatgrass	15
		Unfavorable	300	Indian ricegrass	15
				Bottlebrush squirreltail	15
				Birdfoot sagebrush	5
				Black greasewood	5
155*:					
Elkol	Saline Lowland, 10-14 High Plains Southeast.	Favorable	2,500	Alkali sacaton	30
		Normal	1,800	Basin wildrye	15
		Unfavorable	1,200	Western wheatgrass	10
				Black greasewood	10
				Inland saltgrass	10
				Gardner saltbush	5
				Rubber rabbitbrush	5
Gerdrum Family	Saline Lowland, 10-14 High Plains Southeast.	Favorable	2,500	Alkali sacaton	30
		Normal	1,800	Basin wildrye	15
		Unfavorable	1,200	Black greasewood	15
				Western wheatgrass	10
				Inland saltgrass	10
				Indian ricegrass	5
				Fourwing saltbush	5
				Rubber rabbitbrush	5
156 Evanston	Loamy, 15-17 Southern Plains.	Favorable	1,900	Needleandthread	35
		Normal	1,400	Western wheatgrass	20
		Unfavorable	700	Blue grama	10
				Little bluestem	5
				Big sagebrush	5
				Winterfat	5
157*:					
Evanston	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Idaho fescue	20
		Normal	1,500	Bluebunch wheatgrass	20
		Unfavorable	800	Prairie junegrass	10
				Griffith wheatgrass	10
				Big sagebrush	5
				Threetip sagebrush	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
157*:					
Bonjea	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	10
				Idaho fescue	5
				Needleandthread	5
				Western wheatgrass	5
				Indian ricegrass	5
				Sandberg bluegrass	5
				Fringed sagewort	5
				Antelope bitterbrush	5
				Mountainmahogany	5
158*:					
Fiveoh	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	25
		Normal	1,200	Thickspike wheatgrass	15
		Unfavorable	700	Indian ricegrass	10
				Threadleaf sedge	10
				Silver sagebrush	10
				Bluebunch wheatgrass	5
				Bottlebrush squirreltail	5
				Low rabbitbrush	5
Fiveoh, cobbly substratum	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	25
		Normal	1,200	Indian ricegrass	15
		Unfavorable	700	Thickspike wheatgrass	15
				Threadleaf sedge	10
				Bluebunch wheatgrass	5
				Big sagebrush	5
				Silver sagebrush	5
				Blue grama	5
				Sandberg bluegrass	5
Ryan Park	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	30
		Normal	1,200	Thickspike wheatgrass	20
		Unfavorable	700	Indian ricegrass	15
				Threadleaf sedge	10
				Silver sagebrush	10
				Bottlebrush squirreltail	5
160*:					
Fiveoh, cobbly substratum	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	25
		Normal	1,200	Indian ricegrass	15
		Unfavorable	700	Thickspike wheatgrass	15
				Threadleaf sedge	10
				Bluebunch wheatgrass	5
				Big sagebrush	5
				Silver sagebrush	5
				Blue grama	5
				Sandberg bluegrass	5
Joemre	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	30
		Normal	1,200	Thickspike wheatgrass	20
		Unfavorable	700	Indian ricegrass	15
				Threadleaf sedge	10
				Silver sagebrush	10
				Bottlebrush squirreltail	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
163----------------- Forelle	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	35
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Mutton bluegrass--------------	5
				Indian ricegrass--------------	5
				Prairie junegrass-------------	5
165*:					
Forelle-----------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	35
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Mutton bluegrass--------------	5
				Indian ricegrass--------------	5
				Prairie junegrass-------------	5
Diamondville------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Green needlegrass-------------	5
				Blue grama--------------------	5
				Threadleaf sedge--------------	5
				Fringed sagewort--------------	5
				Douglas rabbitbrush-----------	5
				Prairie junegrass-------------	5
166*:					
Glendive----------	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton----------------	40
		Normal	3,000	Basin wildrye-----------------	20
		Unfavorable	2,500	Alkali bluegrass--------------	10
				Inland saltgrass--------------	5
				Black greasewood--------------	5
				Rubber rabbitbrush------------	5
Redrob------------	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton----------------	40
		Normal	3,000	Basin wildrye-----------------	20
		Unfavorable	2,500	Alkali bluegrass--------------	10
				Inland saltgrass--------------	5
				Greasewood--------------------	5
				Rubber rabbitbrush------------	5
Grenoble----------	Saline Lowland, 10-14 High Plains Southeast.	Favorable	2,500	Alkali sacaton----------------	25
		Normal	1,800	Basin wildrye-----------------	10
		Unfavorable	1,200	Western wheatgrass------------	10
				Inland saltgrass--------------	10
				Indian ricegrass--------------	5
				Sandberg bluegrass------------	5
				Fourwing saltbush-------------	5
				Rubber rabbitbrush------------	5
167*:					
Grenoble----------	Subirrigated, 10-14 High Plains Southeast.	Favorable	4,300	Basin wildrye-----------------	40
		Normal	3,700	Tufted hairgrass--------------	20
		Unfavorable	3,000	Western wheatgrass------------	10
				Slender wheatgrass------------	10
				Alkali sacaton----------------	5
				Rubber rabbitbrush------------	5
				Willow------------------------	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo- sition
			Lb/acre		Pct
167*:					
Gerrard	Wetland, 10-14 High Plains Southeast.	Favorable	6,000	Nebraska sedge	30
		Normal	5,000	Northern reedgrass	10
		Unfavorable	3,500	Willow	10
				Tufted hairgrass	5
				Slim sedge	5
				Baltic rush	5
				American mannagrass	5
				Common reed	5
				Blue-eyed-grass	5
				Arrow-grass	5
				Horsetail	5
				Waterhemlock	5
				American bistort	5
168 Greyback	Coarse Upland, 15-19 Foothills And Mountains Southeast.	Favorable	1,700	Bluebunch wheatgrass	25
		Normal	1,300	Idaho fescue	15
		Unfavorable	800	Western wheatgrass	10
				Threetip sagebrush	10
				Spike fescue	5
				Needleandthread	5
				Mountain muhly	5
				Hood phlox	5
				Fringed sagewort	5
				Winterfat	5
169 Gypla	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton	30
		Normal	3,000	Basin wildrye	20
		Unfavorable	2,500	Alkali bluegrass	10
				Western wheatgrass	5
				Inland saltgrass	5
				Arrow-grass	5
				Black greasewood	5
171*:					
Hanson	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass	25
		Normal	1,100	Parry danthonia	15
		Unfavorable	800	Threetip sagebrush	10
				Griffith wheatgrass	10
				Black sagebrush	5
Quander	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass	30
		Normal	1,100	Griffith wheatgrass	15
		Unfavorable	800	Parry danthonia	15
				Threetip sagebrush	5
				Black sagebrush	5
172*:					
Hapjack	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	25
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	15
				Western wheatgrass	5
				Idaho fescue	5
				Griffith wheatgrass	5
				Winterfat	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
172*:					
Rogert------------	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	25
		Normal	900	Slimstem muhly----------------	15
		Unfavorable	600	Threetip sagebrush------------	15
				Idaho fescue------------------	5
				Griffith wheatgrass-----------	5
				Western wheatgrass------------	5
				Winterfat---------------------	5
Amesmont----------	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	25
		Normal	900	Threetip sagebrush------------	15
		Unfavorable	600	Slimstem muhly----------------	10
				Needleandthread---------------	5
				Western wheatgrass------------	5
				Indian ricegrass--------------	5
				Idaho fescue------------------	5
				Parry danthonia---------------	5
				Griffith wheatgrass-----------	5
				Bluegrass---------------------	5
173*:					
Ipson-------------	Loamy, 15-17 Southern Plains.	Favorable	1,900	Needleandthread---------------	35
		Normal	1,400	Western wheatgrass------------	20
		Unfavorable	700	Blue grama--------------------	10
				Little bluestem---------------	5
				Big sagebrush-----------------	5
				Winterfat---------------------	5
Evanston----------	Loamy, 15-17 Southern Plains.	Favorable	1,900	Needleandthread---------------	35
		Normal	1,400	Western wheatgrass------------	20
		Unfavorable	700	Blue grama--------------------	10
				Little bluestem---------------	5
				Big sagebrush-----------------	5
				Winterfat---------------------	5
174, 175----------- Joemre	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread---------------	30
		Normal	1,200	Thickspike wheatgrass---------	20
		Unfavorable	700	Indian ricegrass--------------	15
				Threadleaf sedge--------------	10
				Silver sagebrush--------------	10
				Bottlebrush squirreltail------	5
176*:					
Kezar-------------	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	20
		Normal	1,500	Idaho fescue------------------	20
		Unfavorable	800	Prairie junegrass-------------	10
				Griffith wheatgrass-----------	10
				Sagebrush---------------------	5
				Threetip sagebrush------------	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo-sition
			Lb/acre		Pct
176*:					
Carbol	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	10
				Idaho fescue	5
				Needleandthread	5
				Griffith wheatgrass	5
				Western wheatgrass	5
				Mountain muhly	5
				Sandberg bluegrass	5
				Threadleaf sedge	5
				Wyoming big sagebrush	5
Rock outcrop.					
177*:					
Kildor	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass	20
		Normal	1,500	Idaho fescue	20
		Unfavorable	800	Prairie junegrass	10
				Griffith wheatgrass	10
				Big sagebrush	5
				Threetip sagebrush	5
Rock outcrop.					
178*:					
Kiltabar	Saline Lowland, 10-14 High Plains Southeast.	Favorable	2,500	Alkali sacaton	30
		Normal	1,800	Basin wildrye	15
		Unfavorable	1,200	Western wheatgrass	10
				Inland saltgrass	10
				Black greasewood	10
				Fourwing saltbush	5
Tismid	Saline Lowland, 10-14 High Plains Southeast.	Favorable	2,500	Alkali sacaton	30
		Normal	1,800	Basin wildrye	20
		Unfavorable	1,200	Western wheatgrass	15
				Black greasewood	15
				Inland saltgrass	5
				Rubber rabbitbrush	5
				Nuttall alkaligrass	5
179*:					
Lakehelen.					
Redfeather.					
Amesmont	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	25
		Normal	900	Threetip sagebrush	15
		Unfavorable	600	Slimstem muhly	10
				Idaho fescue	10
				Needleandthread	5
				Western wheatgrass	5
				Indian ricegrass	5
				Parry danthonia	5
				Griffith wheatgrass	5
				Bluegrass	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
180----------------- Leavitt	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	20
		Normal	1,500	Idaho fescue------------------	20
		Unfavorable	800	Prairie junegrass-------------	10
				Griffith wheatgrass-----------	10
				Threetip sagebrush------------	5
				Parry danthonia---------------	5
				Big sagebrush-----------------	5
181*:					
Leavitt-----------	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	20
		Normal	1,500	Idaho fescue------------------	20
		Unfavorable	800	Griffith wheatgrass-----------	10
				Prairie junegrass-------------	10
				Threetip sagebrush------------	5
				Big sagebrush-----------------	5
Granile-----------	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass----------	30
		Normal	1,100	Griffith wheatgrass-----------	15
		Unfavorable	800	Parry danthonia---------------	15
				Threetip sagebrush------------	5
				Black sagebrush---------------	5
182*:					
Leavitt-----------	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	20
		Normal	1,500	Idaho fescue------------------	20
		Unfavorable	800	Griffith wheatgrass-----------	10
				Prairie junegrass-------------	10
				Threetip sagebrush------------	5
				Big sagebrush-----------------	5
Hanson------------	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass----------	25
		Normal	1,100	Parry danthonia---------------	15
		Unfavorable	800	Threetip sagebrush------------	10
				Griffith wheatgrass-----------	10
				Black sagebrush---------------	5
183*:					
Leavitt-----------	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	20
		Normal	1,500	Idaho fescue------------------	20
		Unfavorable	800	Griffith wheatgrass-----------	10
				Prairie junegrass-------------	10
				Threetip sagebrush------------	5
				Big sagebrush-----------------	5
Quander-----------	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass----------	30
		Normal	1,100	Griffith wheatgrass-----------	15
		Unfavorable	800	Parry danthonia---------------	15
				Threetip sagebrush------------	5
				Black sagebrush---------------	5
184----------------- Luhon	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	20
		Normal	900	Western wheatgrass------------	20
		Unfavorable	700	Mutton bluegrass--------------	10
				Needleandthread---------------	10
				Black sagebrush---------------	10
				Fringed sagewort--------------	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Compo-sition
		Kind of year	Dry weight		
			Lb/acre		Pct
185*:					
Luvar	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Green needlegrass	5
				Mutton bluegrass	5
				Douglas rabbitbrush	5
Stylite	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Green needlegrass	5
				Mutton bluegrass	5
				Low rabbitbrush	5
Diamonkit	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	15
		Normal	900	Western wheatgrass	10
		Unfavorable	700	Needleandthread	10
				Mutton bluegrass	10
				Black sagebrush	10
				Green needlegrass	5
				Indian ricegrass	5
				Squirreltail	5
				Blue grama	5
				Prairie junegrass	5
				Sandberg bluegrass	5
				Threadleaf sedge	5
				Threetip sagebrush	5
186*:					
Lymanson loam	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass	20
		Normal	1,500	Idaho fescue	20
		Unfavorable	800	Prairie junegrass	10
				Griffith wheatgrass	10
				Threetip sagebrush	5
				Big sagebrush	5
Lymanson cobbly loam	Coarse Upland, 15-19 Foothills And Mountains Southeast.	Favorable	1,700	Bluebunch wheatgrass	30
		Normal	1,300	Idaho fescue	20
		Unfavorable	800	Western wheatgrass	10
				Prairie junegrass	10
				Threetip sagebrush	5
188 McFadden	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Needleandthread	25
		Normal	900	Bluebunch wheatgrass	20
		Unfavorable	700	Threadleaf sedge	15
				Indian ricegrass	10
				Mutton bluegrass	10
				Black sagebrush	5
189*:					
Miracle	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass	20
		Normal	1,500	Idaho fescue	20
		Unfavorable	800	Prairie junegrass	10
				Griffith wheatgrass	10
				Big sagebrush	5
				Threetip sagebrush	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo- sition
			Lb/acre		Pct
189*:					
Cheadle-----------	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass----------	30
		Normal	1,100	Parry danthonia---------------	15
		Unfavorable	800	Threetip sagebrush------------	5
				Black sagebrush---------------	5
190*:					
Moyerson----------	Impervious Clay, 10-14 High Plains Southeast.	Favorable	700	Western wheatgrass------------	25
		Normal	500	Birdfoot sagebrush------------	25
		Unfavorable	350	Bottlebrush squirreltail------	10
				Indian ricegrass--------------	10
				Gardner saltbush--------------	10
Kemmerer----------	Impervious Clay, 10-14 High Plains Southeast.	Favorable	700	Birdfoot sagebrush------------	25
		Normal	500	Western wheatgrass------------	20
		Unfavorable	350	Bottlebrush squirreltail------	10
				Indian ricegrass--------------	10
				Gardner saltbush--------------	10
191*:					
Nathale-----------	Coarse Upland, 15-19 Foothills And Mountains Southeast.	Favorable	1,700	Bluebunch wheatgrass----------	30
		Normal	1,300	Idaho fescue------------------	20
		Unfavorable	800	Western wheatgrass------------	10
				Prairie junegrass-------------	10
Passcreek, cobbly subsoil----------	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass----------	20
		Normal	1,500	Idaho fescue------------------	20
		Unfavorable	800	Prairie junegrass-------------	10
				Big sagebrush-----------------	5
				Threetip sagebrush------------	5
Rock outcrop.					
192---------------- Pahlow	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread---------------	30
		Normal	1,200	Thickspike wheatgrass---------	20
		Unfavorable	700	Indian ricegrass--------------	15
				Threadleaf sedge--------------	10
				Silver sagebrush--------------	10
				Bottlebrush squirreltail------	5
193*:					
Pilotpeak---------	Very Shallow, 10-14 High Plains Southeast.	Favorable	600	Bluebunch wheatgrass----------	40
		Normal	450	Western wheatgrass------------	10
		Unfavorable	250	Bottlebrush squirreltail------	10
				Antelope bitterbrush----------	5
				Black sagebrush---------------	5
Canwall-----------	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	20
		Normal	900	Indian ricegrass--------------	10
		Unfavorable	700	Needleandthread---------------	10
				Western wheatgrass------------	5
				Sandberg bluegrass------------	5
				Mountainmahogany--------------	5
				Black sagebrush---------------	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo- sition
			Lb/acre		Pct
194---------------- Pinelli	Clayey, 10-14 High Plains Southeast.	Favorable	1,300	Thickspike wheatgrass---------	40
		Normal	1,000	Green needlegrass-------------	20
		Unfavorable	500	Birdfoot sagebrush------------	10
				Bluebunch wheatgrass----------	5
				Bottlebrush squirreltail------	5
196*:					
Poin--------------	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	25
		Normal	900	Slimstem muhly----------------	15
		Unfavorable	600	Threetip sagebrush------------	15
				Idaho fescue------------------	5
				Griffith wheatgrass-----------	5
				Winterfat---------------------	5
Bowen-------------	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	25
		Normal	900	Slimstem muhly----------------	15
		Unfavorable	600	Threetip sagebrush------------	15
				Idaho fescue------------------	5
				Griffith wheatgrass-----------	5
Rock outcrop.					
197*:					
Poposhia----------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Mutton bluegrass--------------	5
				Low rabbitbrush---------------	5
				Green needlegrass-------------	5
Blazon------------	Shallow Clayey, 10-14 High Plains Southeast.	Favorable	1,000	Western wheatgrass------------	40
		Normal	800	Bluebunch wheatgrass----------	10
		Unfavorable	500	Winterfat---------------------	10
				Mutton bluegrass--------------	10
				Bottlebrush squirreltail------	10
198*:					
Poposhia----------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Mutton bluegrass--------------	5
				Low rabbitbrush---------------	5
				Green needlegrass-------------	5
Forelle-----------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	35
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Mutton bluegrass--------------	5
				Indian ricegrass--------------	5
				Prairie junegrass-------------	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
199*:					
Poposhia	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Mutton bluegrass	5
				Low rabbitbrush	5
				Green needlegrass	5
Chaperton	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Mutton bluegrass	5
				Prairie junegrass	5
				Hood phlox	5
200*:					
Rainbolt	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass	20
		Normal	1,500	Idaho fescue	20
		Unfavorable	800	Prairie junegrass	10
				Griffith wheatgrass	10
				Big sagebrush	5
				Threetip sagebrush	5
Morset	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass	20
		Normal	1,500	Idaho fescue	20
		Unfavorable	800	Prairie junegrass	10
				Griffith wheatgrass	10
				Wyoming big sagebrush	5
				Threetip sagebrush	5
201*:					
Redfeather.					
Lakehelen.					
Rogert	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass	25
		Normal	900	Slimstem muhly	15
		Unfavorable	600	Threetip sagebrush	15
				Idaho fescue	5
				Griffith wheatgrass	5
				Western wheatgrass	5
				Winterfat	5
202 Redrob	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton	40
		Normal	3,000	Basin wildrye	20
		Unfavorable	2,500	Alkali bluegrass	10
				Inland saltgrass	5
				Greasewood	5
				Rubber rabbitbrush	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
203*:					
Redrob, frequently flooded	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton	40
		Normal	3,000	Basin wildrye	20
		Unfavorable	2,500	Alkali bluegrass	10
				Inland saltgrass	5
				Greasewood	5
				Rubber rabbitbrush	5
Grenoble	Saline Lowland, 10-14 High Plains Southeast.	Favorable	2,500	Alkali sacaton	25
		Normal	1,800	Basin wildrye	10
		Unfavorable	1,200	Western wheatgrass	10
				Inland saltgrass	10
				Indian ricegrass	5
				Sandberg bluegrass	5
				Fourwing saltbush	5
				Rubber rabbitbrush	5
Redrob	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton	40
		Normal	3,000	Basin wildrye	20
		Unfavorable	2,500	Alkali bluegrass	10
				Inland saltgrass	5
				Greasewood	5
				Rubber rabbitbrush	5
204*:					
Redrob, frequently flooded	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton	40
		Normal	3,000	Basin wildrye	20
		Unfavorable	2,500	Alkali bluegrass	10
				Inland saltgrass	5
				Greasewood	5
				Rubber rabbitbrush	5
Redrob	Saline Subirrigated, 10-14 High Plains Southeast.	Favorable	3,400	Alkali sacaton	40
		Normal	3,000	Basin wildrye	20
		Unfavorable	2,500	Alkali bluegrass	10
				Inland saltgrass	5
				Greasewood	5
				Rubber rabbitbrush	5
206*:					
Rentsac	Very Shallow, 10-14 High Plains Southeast.	Favorable	600	Bluebunch wheatgrass	40
		Normal	450	Bottlebrush squirreltail	10
		Unfavorable	250	Western wheatgrass	10
				Indian ricegrass	5
				Needleandthread	5
				Prairie junegrass	5
				Sandberg bluegrass	5
				Threadleaf sedge	5
				Big sagebrush	5
				Mountainmahogany	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo- sition
			Lb/acre		Pct
206*:					
Wycolo	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Green needlegrass	5
				Mutton bluegrass	5
				Low rabbitbrush	5
207*:					
Renvers	Very Shallow, 10-14 High Plains Southeast.	Favorable	600	Bluebunch wheatgrass	40
		Normal	450	Bottlebrush squirreltail	10
		Unfavorable	250	Western wheatgrass	10
				Antelope bitterbrush	5
				Black sagebrush	5
Chalkhill	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Western wheatgrass	10
		Unfavorable	700	Needleandthread	10
				Black sagebrush	10
				Green needlegrass	5
				Indian ricegrass	5
				Squirreltail	5
				Blue grama	5
				Prairie junegrass	5
				Sandberg bluegrass	5
				Threadleaf sedge	5
				Winterfat	5
208*:					
Rimton.					
Passcreek, cobbly subsoil	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass	30
		Normal	1,100	Parry danthonia	15
		Unfavorable	800	Griffith wheatgrass	10
				Threetip sagebrush	5
				Black sagebrush	5
Miracle	Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	2,000	Bluebunch wheatgrass	20
		Normal	1,500	Idaho fescue	20
		Unfavorable	800	Prairie junegrass	10
				Griffith wheatgrass	10
				Big sagebrush	5
				Threetip sagebrush	5
210*:					
Rock outcrop.					
Bonjea	Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	700	Bluebunch wheatgrass	30
		Normal	550	Slimstem muhly	15
		Unfavorable	350	Threetip sagebrush	10
				Black sagebrush	10
				Idaho fescue	5
				Indian ricegrass	5
				Sandberg bluegrass	5
				Antelope bitterbrush	5
				Mountainmahogany	5
				Prairie junegrass	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
211*:					
Rock outcrop.					
Bruja	Rocky Hills, 10-14 High Plains Southeast.	Favorable	800	Mountainmahogany	40
		Normal	600	Bluebunch wheatgrass	25
		Unfavorable	350	Western wheatgrass	15
				Needleandthread	15
Byrnie	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Needleandthread	25
		Normal	900	Bluebunch wheatgrass	20
		Unfavorable	700	Threadleaf sedge	15
				Indian ricegrass	10
				Mutton bluegrass	10
				Black sagebrush	5
				Western wheatgrass	5
212*:					
Rock outcrop.					
Cathedral	Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	700	Bluebunch wheatgrass	35
		Normal	550	Slimstem muhly	15
		Unfavorable	350	Black sagebrush	10
				Threetip sagebrush	10
				Idaho fescue	5
				Griffith wheatgrass	5
213*:					
Rock outcrop.					
Cathedral	Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	700	Bluebunch wheatgrass	35
		Normal	550	Slimstem muhly	15
		Unfavorable	350	Black sagebrush	10
				Threetip sagebrush	10
				Idaho fescue	5
				Griffith wheatgrass	5
Alderon.					
214*:					
Rock outcrop.					
Pilotpeak	Very Shallow, 10-14 High Plains Southeast.	Favorable	600	Bluebunch wheatgrass	40
		Normal	450	Western wheatgrass	10
		Unfavorable	250	Bottlebrush squirreltail	10
				Antelope bitterbrush	5
				Black sagebrush	5
215*:					
Rock outcrop.					
Rogert	Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	700	Bluebunch wheatgrass	35
		Normal	550	Slimstem muhly	15
		Unfavorable	350	Threetip sagebrush	10
				Black sagebrush	10
				Idaho fescue	5
				Griffith wheatgrass	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
216, 217----------- Rock River	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Mutton bluegrass--------------	5
				Green needlegrass-------------	5
				Low rabbitbrush---------------	5
219*:					
Rogert------------	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	25
		Normal	900	Slimstem muhly----------------	15
		Unfavorable	600	Threetip sagebrush------------	15
				Idaho fescue------------------	5
				Griffith wheatgrass-----------	5
				Western wheatgrass------------	5
				Winterfat---------------------	5
Lakehelen.					
Rock outcrop.					
220*:					
Rogert------------	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	25
		Normal	900	Slimstem muhly----------------	15
		Unfavorable	600	Threetip sagebrush------------	15
				Idaho fescue------------------	5
				Griffith wheatgrass-----------	5
				Western wheatgrass------------	5
				Winterfat---------------------	5
Rock outcrop.					
Amesmont----------	Shallow Igneous, 15-19 Foothills And Mountains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	25
		Normal	900	Threetip sagebrush------------	15
		Unfavorable	600	Slimstem muhly----------------	10
				Idaho fescue------------------	10
				Needleandthread---------------	5
				Western wheatgrass------------	5
				Indian ricegrass--------------	5
				Parry danthonia---------------	5
				Griffith wheatgrass-----------	5
				Bluegrass---------------------	5
221---------------- Rohonda	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread---------------	30
		Normal	1,200	Thickspike wheatgrass---------	20
		Unfavorable	700	Indian ricegrass--------------	15
				Threadleaf sedge--------------	10
				Silver sagebrush--------------	10
				Bottlebrush squirreltail------	5
222*:					
Rohonda-----------	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread---------------	30
		Normal	1,200	Thickspike wheatgrass---------	20
		Unfavorable	700	Indian ricegrass--------------	15
				Threadleaf sedge--------------	10
				Silver sagebrush--------------	10
				Bottlebrush squirreltail------	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
222*:					
Tieside	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Needleandthread	25
		Normal	900	Bluebunch wheatgrass	20
		Unfavorable	700	Threadleaf sedge	15
				Indian ricegrass	10
				Mutton bluegrass	10
				Black sagebrush	5
223*:					
Rohonda	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass	30
		Normal	1,100	Griffith wheatgrass	15
		Unfavorable	800	Parry danthonia	15
				Threetip sagebrush	5
				Black sagebrush	5
Cheadle	Rocky Hills, 15-19 Foothills And Mountains Southeast.	Favorable	1,150	Mountainmahogany	30
		Normal	900	Bluebunch wheatgrass	20
		Unfavorable	550	Spike fescue	10
				Mountain muhly	5
				Prairie junegrass	5
				Buckwheat	5
				Antelope bitterbrush	5
				Big sagebrush	5
Rock outcrop.					
224 Ryark	Sandy, 10-14 High Plains Southeast.	Favorable	1,500	Needleandthread	30
		Normal	1,200	Thickspike wheatgrass	20
		Unfavorable	700	Indian ricegrass	15
				Threadleaf sedge	10
				Silver sagebrush	10
				Bottlebrush squirreltail	5
225*:					
Shirleybasin	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Mutton bluegrass	5
				Green needlegrass	5
				Low rabbitbrush	5
Twocabin	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Western wheatgrass	20
		Unfavorable	700	Mutton bluegrass	10
				Needleandthread	10
				Black sagebrush	10
				Fringed sagewort	5
Lahtida	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Green needlegrass	5
				Douglas rabbitbrush	5
				Mutton bluegrass	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
226----------------- Silas	Subirrigated, 15-19 Foothills And Mountains Southeast.	Favorable Normal Unfavorable	4,500 4,000 3,300	Basin wildrye Tufted hairgrass Slender wheatgrass Western wheatgrass Shrubby cinquefoil Willow	40 15 10 10 5 5
227*:					
Silas, gravelly substratum-------	Subirrigated, 15-19 Foothills And Mountains Southeast.	Favorable Normal Unfavorable	4,500 4,000 3,300	Basin wildrye Tufted hairgrass Slender wheatgrass Western wheatgrass Shrubby cinquefoil Willow	40 15 10 10 5 5
Vensora-----------	Wetland, 15-19 Foothills And Mountains Southeast.	Favorable Normal Unfavorable	6,500 5,500 4,000	Tufted hairgrass Nebraska sedge Slough sedge Willow	30 15 10 10
228----------------- Stunner	Loamy, 10-14 High Plains Southeast.	Favorable Normal Unfavorable	1,400 1,100 600	Western wheatgrass Needleandthread Bluebunch wheatgrass Big sagebrush Mutton bluegrass Low rabbitbrush Green needlegrass	30 15 10 10 5 5 5
229*:					
Stunner-----------	Loamy, 10-14 High Plains Southeast.	Favorable Normal Unfavorable	1,400 1,100 600	Western wheatgrass Needleandthread Bluebunch wheatgrass Wyoming big sagebrush Low rabbitbrush Green needlegrass	30 15 10 10 5 5
Borollic Camborthids------	Sandy, 10-14 High Plains Southeast.	Favorable Normal Unfavorable	1,500 1,200 700	Needleandthread Thickspike wheatgrass Indian ricegrass Threadleaf sedge Silver sagebrush	30 20 15 10 10
230*:					
Stunner-----------	Saline Loamy, 10-14 High Plains Southeast.	Favorable Normal Unfavorable	900 700 500	Western wheatgrass Needleandthread Gardner saltbush Birdfoot sagebrush Bluebunch wheatgrass Wyoming big sagebrush	25 15 15 15 10 10
Tisworth----------	Impervious Clay, 10-14 High Plains Southeast.	Favorable Normal Unfavorable	700 500 350	Western wheatgrass Birdfoot sagebrush Indian ricegrass Bottlebrush squirreltail Gardner saltbush Sandberg bluegrass	25 25 10 10 10 5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Compo- sition
			Lb/acre		Pct
230*:					
Blazon	Very Shallow, 10-14 High Plains Southeast.	Favorable	600	Bluebunch wheatgrass	40
		Normal	450	Western wheatgrass	10
		Unfavorable	250	Bottlebrush squirreltail	10
				Black sagebrush	10
				Mutton bluegrass	5
232 Teeler	Shallow Loamy, 15-19 Foothills And Mountains Southeast.	Favorable	1,400	Bluebunch wheatgrass	30
		Normal	1,100	Griffith wheatgrass	15
		Unfavorable	800	Parry danthonia	15
				Threetip sagebrush	5
				Black sagebrush	5
233*:					
Thiel	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Western wheatgrass	20
		Unfavorable	700	Mutton bluegrass	10
				Needleandthread	10
				Black sagebrush	10
				Fringed sagewort	5
Lymanson	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass	20
		Normal	900	Western wheatgrass	20
		Unfavorable	700	Mutton bluegrass	10
				Needleandthread	10
				Black sagebrush	10
				Fringed sagewort	5
Leavitt	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass	30
		Normal	1,100	Needleandthread	15
		Unfavorable	600	Bluebunch wheatgrass	10
				Big sagebrush	10
				Mutton bluegrass	5
				Douglas rabbitbrush	5
				Green needlegrass	5
234*:					
Tieside	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Needleandthread	25
		Normal	900	Bluebunch wheatgrass	20
		Unfavorable	700	Threadleaf sedge	15
				Indian ricegrass	10
				Mutton bluegrass	10
				Black sagebrush	5
Pilotpeak	Rocky Hills, 10-14 High Plains Southeast.	Favorable	800	Mountainmahogany	40
		Normal	600	Bluebunch wheatgrass	25
		Unfavorable	350	Western wheatgrass	15
				Needleandthread	15
Rock outcrop.					
235 Tismid	Impervious Clay, 10-14 High Plains Southeast.	Favorable	700	Western wheatgrass	25
		Normal	500	Birdfoot sagebrush	25
		Unfavorable	350	Bottlebrush squirreltail	10
				Indian ricegrass	10
				Gardner saltbush	10
				Hood phlox	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production: Kind of year	Total production: Dry weight	Characteristic vegetation	Composition
			Lb/acre		Pct
236*:					
Tisworth----------	Saline Upland, 10-14 High Plains Southeast.	Favorable	650	Gardner saltbush--------------	40
		Normal	500	Western wheatgrass------------	15
		Unfavorable	300	Indian ricegrass--------------	15
				Bottlebrush squirreltail------	10
				Black greasewood--------------	5
				Birdfoot sagebrush------------	5
Gerdrum Family----	Saline Upland, 10-14 High Plains Southeast.	Favorable	650	Gardner saltbush--------------	40
		Normal	500	Western wheatgrass------------	15
		Unfavorable	300	Indian ricegrass--------------	15
				Bottlebrush squirreltail------	15
				Birdfoot sagebrush------------	5
				Black greasewood--------------	5
237*:					
Tisworth----------	Saline Loamy, 10-14 High Plains Southeast.	Favorable	900	Western wheatgrass------------	25
		Normal	700	Gardner saltbush--------------	15
		Unfavorable	500	Birdfoot sagebrush------------	15
				Needleandthread---------------	15
				Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Threadleaf sedge--------------	5
				Sandberg bluegrass------------	5
Gerdrum Family----	Saline Loamy, 10-14 High Plains Southeast.	Favorable	900	Western wheatgrass------------	25
		Normal	700	Needleandthread---------------	15
		Unfavorable	500	Birdfoot sagebrush------------	15
				Gardner saltbush--------------	15
				Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Sandberg bluegrass------------	5
238*:					
Tule--------------	Very Shallow, 10-14 High Plains Southeast.	Favorable	600	Bluebunch wheatgrass----------	40
		Normal	450	Bottlebrush squirreltail------	10
		Unfavorable	250	Western wheatgrass------------	10
				Antelope bitterbrush----------	5
				Black sagebrush---------------	5
Chalkville--------	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Bluebunch wheatgrass----------	20
		Normal	900	Western wheatgrass------------	10
		Unfavorable	700	Black sagebrush---------------	10
				Needleandthread---------------	5
				Mutton bluegrass--------------	5
				Green needlegrass-------------	5
				Indian ricegrass--------------	5
				Prairie junegrass-------------	5
				Winterfat---------------------	5
				Big sagebrush-----------------	5
239*:					
Tyzak-------------	Rocky Hills, 15-19 Foothills And Mountains Southeast.	Favorable	1,150	True mountainmahogany---------	30
		Normal	900	Bluebunch wheatgrass----------	20
		Unfavorable	550	Needleandthread---------------	15
				Spike fescue------------------	15
				Antelope bitterbrush----------	10
Rock outcrop.					

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		Pct
240---------------- Wycolo	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Green needlegrass-------------	5
				Mutton bluegrass--------------	5
				Low rabbitbrush---------------	5
241*:					
Wycolo------------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Green needlegrass-------------	5
				Mutton bluegrass--------------	5
				Low rabbitbrush---------------	5
Alcova------------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Mutton bluegrass--------------	5
				Prairie junegrass-------------	5
				Fringed sagewort--------------	5
				Green needlegrass-------------	5
243*:					
Wycolo------------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Green needlegrass-------------	5
				Mutton bluegrass--------------	5
				Low rabbitbrush---------------	5
Tieside-----------	Shallow Sandy, 10-14 High Plains Southeast.	Favorable	1,200	Needleandthread---------------	25
		Normal	900	Bluebunch wheatgrass----------	20
		Unfavorable	700	Threadleaf sedge--------------	15
				Indian ricegrass--------------	10
				Mutton bluegrass--------------	10
				Black sagebrush---------------	5
244*:					
Wycolo------------	Loamy, 10-14 High Plains Southeast.	Favorable	1,400	Western wheatgrass------------	30
		Normal	1,100	Needleandthread---------------	15
		Unfavorable	600	Bluebunch wheatgrass----------	10
				Big sagebrush-----------------	10
				Green needlegrass-------------	5
				Mutton bluegrass--------------	5
				Low rabbitbrush---------------	5
Thermopolis-------	Shallow Loamy, 10-14 High Plains Southeast.	Favorable	1,200	Western wheatgrass------------	20
		Normal	900	Bluebunch wheatgrass----------	20
		Unfavorable	700	Needleandthread---------------	10
				Mutton bluegrass--------------	10
				Black sagebrush---------------	10
				Fringed sagewort--------------	5
Rock outcrop.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8A.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE I

(Dashes indicate that the species is not suited to the soils in the group)

Woody species	Group 1			Group 1KW			Group 2			Group 2KW			Group 3		
	Precipitation			Precipitation			Precipitation			Precipitation			Precipitation		
	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers*:															
Austrian pine	---	17	22	---	---	---	**16	19	22	---	---	---	---	**16	22
Black Hills spruce	---	**16	22	**15	17	22	**15	18	22	**16	19	21	---	**16	22
Blue spruce	**12	16	22	---	16	22	**14	18	22	**12	18	22	---	16	22
Eastern redcedar	15	18	23	15	17	22	16	19	23	16	19	22	10	13	21
Ponderosa pine	**16	18	23	**16	18	23	**17	19	23	**17	20	23	**14	16	22
Rocky Mountain juniper	10	14	21	10	14	21	11	15	21	11	16	21	8	10	18
Scotch pine	---	**17	21	---	---	---	**13	18	21	---	---	---	---	**15	20
Deciduous trees:															
Boxelder	---	**16	21	---	---	---	**12	18	21	---	---	---	---	---	20
Golden willow	**20	**24	31	**20	**24	31	**20	26	31	**22	26	31	---	---	29
Green ash	**14	18	28	**14	17	27	**16	20	28	**15	18	27	**13	16	28
Hackberry	**14	18	26	**14	17	26	**16	20	26	**15	18	26	**14	18	24
Honeylocust	15	19	28	15	19	28	**17	21	28	16	20	28	14	17	26
Plains cottonwood	**29	**31	41	**29	31	41	**33	35	41	**31	33	41	---	---	41
Russian-olive	15	18	24	16	18	24	17	20	24	17	20	24	13	15	23
Siberian crabapple	**11	13	19	---	---	---	**12	15	19	---	---	---	---	12	19
Siberian elm	**20	24	33	**20	24	33	**22	26	30	21	23	33	**18	23	33
Shrubs:															
American plum	---	**7	10	---	**7	10	**5	8	10	---	7	10	---	**7	10
Basin big sagebrush	---	---	---	---	---	---	---	---	---	---	---	---	4	5	---
Common chokecherry	**7	**7	11	**7	**7	11	**7	7	11	**7	7	11	**7	**8	11
Fourwing saltbush	2	---	---	2	---	---	2	---	---	2	---	---	2	---	---
Golden currant	---	**4	6	---	---	---	**4	**5	6	---	---	---	---	**4	6
Greasewood	---	---	---	3	---	---	---	---	---	4	---	10	**5	---	---
Lilac	**5	7	10	**5	7	10	**6	8	10	**6	8	---	**3	7	10
Nanking cherry	**3	5	8	---	---	---	**4	6	8	---	---	---	**3	5	8
Peking cotoneaster	**3	5	9	---	---	---	**4	6	9	---	---	---	---	4	8
Redosier dogwood	---	4	8	---	---	---	4	5	8	---	---	---	---	---	8
Rubber rabbitbrush	---	---	---	3	---	---	---	---	---	---	---	---	3	---	---
Rugosa rose	2	4	6	---	---	---	3	5	6	---	---	---	---	4	6
Saskatoon serviceberry	---	**4	7	---	---	---	**4	5	7	---	---	14	7	---	5
Siberian peashrub	7	9	14	6	9	14	8	10	14	6	9	12	---	8	12
Silver buffaloberry	---	**7	12	---	**7	12	**6	8	12	**6	8	9	3	**7	11
Skunkbush sumac	3	5	9	3	5	9	4	6	9	4	6	11	5	5	9
Tatarian honeysuckle	6	8	11	6	8	11	7	9	11	6	8	11	---	7	11
Western sandcherry	2	3	3	---	---	---	2	3	3	---	---	---	2	3	3

See footnotes at end of table.

TABLE 8A.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE I--Continued

Woody species	Group 4			Group 4C			Group 4CK			Group 4K		
	Precipitation			Precipitation			Precipitation			Precipitation		
	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers*:												
Austrian pine	---	15	22	---	---	22	---	---	---	---	---	---
Black Hills spruce	---	---	20	---	---	20	---	---	19	---	---	19
Blue spruce	---	---	20	---	---	19	---	---	18	---	---	19
Eastern redcedar	10	12	20	8	11	20	8	11	19	9	12	19
Ponderosa pine	**12	15	22	**10	12	21	**10	12	20	**12	15	21
Rocky Mountain juniper	8	10	18	8	10	18	---	---	17	---	---	17
Scotch pine	---	---	20	---	---	20	---	---	---	---	---	---
Deciduous trees:												
Boxelder	---	---	19	---	---	19	---	---	---	---	---	---
Golden willow	---	---	29	---	---	29	---	---	27	---	---	27
Green ash	**13	15	28	**10	12	25	**10	12	23	**12	14	26
Hackberry	**14	18	24	**12	16	23	**11	15	22	**13	17	23
Honeylocust	13	16	26	12	14	24	11	13	22	12	15	24
Plains cottonwood	---	---	41	---	---	41	---	---	39	---	---	39
Russian-olive	11	14	22	9	11	22	8	11	21	10	13	21
Siberian crabapple	---	12	19	---	11	19	---	---	---	---	---	---
Siberian elm	**17	21	33	**15	19	31	---	**13	29	**15	19	29
Shrubs:												
American plum	---	**7	10	---	**7	10	---	6	10	---	---	10
Basin big sagebrush	---	---	---	---	---	---	---	---	---	---	---	---
Common chokecherry	**7	8	11	**7	8	11	---	7	11	---	---	11
Fourwing saltbush	2	---	---	2	---	---	2	2	---	2	---	---
Golden currant	---	**4	6	---	---	6	---	---	6	---	---	6
Greasewood	---	---	---	---	---	---	---	---	---	---	---	---
Lilac	**5	7	10	**4	5	9	**4	5	9	**5	7	10
Nanking cherry	**3	5	8	**3	5	8	---	---	---	---	---	---
Peking cotoneaster	**3	4	8	---	4	8	---	---	---	---	---	---
Redosier dogwood	---	---	8	---	---	7	---	---	---	---	---	---
Rubber rabbitbrush	2	---	---	2	---	---	2	---	---	---	---	---
Rugosa rose	3	4	6	---	3	5	---	---	---	---	---	---
Saskatoon serviceberry	---	---	5	---	---	5	---	---	---	---	---	---
Siberian peashrub	6	7	12	4	5	12	4	5	11	5	6	11
Silver buffaloberry	---	**7	10	---	---	10	---	---	10	---	7	10
Skunkbush sumac	3	5	9	3	4	8	3	4	8	3	5	9
Tatarian honeysuckle	5	7	11	4	6	11	4	6	11	3	5	11
Western sandcherry	2	3	3	---	---	3	---	---	---	---	---	---

See footnotes at end of table.

TABLE 8A.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE I--Continued

Woody species	Group 5			Group 5K			Group 5KK			Group 6		
	Precipitation			Precipitation			Precipitation			Precipitation		
	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers*:												
Austrian pine	---	**16	22	---	---	---	---	---	---	---	---	13
Black Hills spruce	---	---	20	---	---	20	---	---	19	---	---	16
Blue spruce	---	---	21	---	---	21	---	---	20	---	---	17
Eastern redcedar	10	13	20	8	10	20	7	8	19	**6	**8	16
Ponderosa pine	**13	15	22	**10	13	22	**8	11	18	**8	**10	18
Rocky Mountain juniper	8	10	17	8	10	17	7	8	13	**6	**10	14
Scotch pine	---	**15	20	---	---	---	---	---	---	---	**11	16
Deciduous trees:												
Boxelder	---	---	20	---	---	---	---	---	---	---	---	16
Golden willow	---	---	29	---	---	---	---	---	---	---	---	---
Green ash	**12	15	27	**11	13	28	**9	11	22	---	**11	22
Hackberry	---	14	24	---	---	25	---	---	20	---	---	19
Honeylocust	12	15	26	11	14	28	9	12	22	---	**11	21
Plains cottonwood	---	---	41	---	---	41	---	---	33	---	---	28
Russian-olive	11	14	23	9	11	23	8	9	19	---	**9	18
Siberian crabapple	---	12	19	---	---	---	---	---	---	---	---	15
Siberian elm	**17	22	33	**16	20	33	**13	16	27	**12	**15	26
Shrubs:												
American plum	---	**7	10	---	---	10	---	---	8	---	---	8
Basin big sagebrush	4	---	---	3	---	---	3	---	---	3	4	---
Common chokecherry	**6	8	11	---	7	11	6	9	9	---	**6	9
Fourwing saltbush	2	---	---	2	2	---	2	---	---	2	2	---
Golden currant	---	---	6	---	---	---	---	---	---	---	---	5
Greasewood	---	---	---	3	---	---	3	---	---	---	---	---
Lilac	**5	6	10	**4	5	10	**4	5	10	---	**4	7
Nanking cherry	---	**4	8	---	---	---	---	---	---	---	---	6
Peking cotoneaster	---	**4	8	---	---	---	---	---	---	---	---	7
Redosier dogwood	---	---	8	---	---	---	---	---	---	---	---	6
Rubber rabbitbrush	---	---	---	2	---	---	2	2	---	2	3	---
Rugosa rose	2	3	6	---	---	---	---	---	---	**2	**3	5
Saskatoon serviceberry	---	---	5	---	---	5	---	---	4	---	---	4
Siberian peashrub	5	6	12	4	6	12	3	5	10	**4	**5	9
Silver buffaloberry	---	**6	11	---	**6	11	---	**6	10	---	**4	9
Skunkbush sumac	3	5	8	3	5	8	3	5	8	---	---	7
Tatarian honeysuckle	5	7	11	4	6	11	4	6	11	---	**5	9
Western sandcherry	2	3	3	---	---	---	---	---	---	---	---	3

See footnotes at end of table.

TABLE 8A.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE I--Continued

Woody species	Group 6D			Group 6DK			Group 6G			Group 6GK		
	Precipitation			Precipitation			Precipitation			Precipitation		
	10-14"	15-19"	Irri-gated	10-14"	15-19"	Irri-gated	10-14"	15-19"	Irri-gated	10-14"	15-19"	Irri-gated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers*:												
Austrian pine	---	**13	22	---	---	---	---	---	16	---	---	---
Black Hills spruce	---	---	20	---	---	18	---	---	20	---	---	18
Blue spruce	---	---	21	---	---	19	---	---	20	---	---	19
Eastern redcedar	8	11	20	7	10	18	8	10	19	7	9	18
Ponderosa pine	**11	13	22	**11	13	22	**10	13	18	**10	13	22
Rocky Mountain juniper	8	10	18	8	10	18	8	10	13	8	10	18
Scotch pine	---	13	20	---	---	---	---	13	---	---	---	---
Deciduous trees:												
Boxelder	---	---	20	---	---	---	---	---	20	---	---	---
Golden willow	---	---	29	---	---	29	---	---	---	---	---	---
Green ash	**11	14	28	**10	13	25	---	**13	28	---	12	26
Hackberry	---	12	25	---	11	23	---	---	24	---	---	22
Honeylocust	14	17	27	14	17	27	---	13	26	---	13	26
Plains cottonwood	---	---	35	---	---	35	---	---	35	---	---	35
Russian-olive	11	14	24	11	24	24	10	13	23	10	13	23
Siberian crabapple	---	**12	19	---	---	---	---	---	19	---	---	---
Siberian elm	17	21	33	17	21	33	**15	20	33	**15	20	33
Shrubs:												
American plum	---	---	10	---	---	10	---	---	10	---	---	10
Basin big sagebrush	3	4	---	3	4	---	3	4	---	3	4	---
Common chokecherry	---	**7	11	---	**7	11	---	**7	11	---	**7	11
Fourwing saltbush	2	2	---	2	---	---	2	2	---	2	2	---
Golden currant	---	---	6	---	---	---	---	---	6	---	---	---
Greasewood	---	---	---	---	---	---	---	---	---	---	---	---
Lilac	---	**5	9	---	**5	9	---	**5	9	---	**5	9
Nanking cherry	---	**4	8	---	---	---	---	---	7	---	---	---
Peking cotoneaster	---	**4	8	---	---	---	---	**4	8	---	---	---
Redosier dogwood	---	---	7	---	---	---	---	---	7	---	---	---
Rubber rabbitbrush	3	3	---	---	---	---	2	3	---	2	3	6
Rugosa rose	2	3	6	---	---	---	2	3	6	---	---	---
Saskatoon serviceberry	---	---	5	---	---	---	---	---	5	---	---	---
Siberian peashrub	5	7	12	4	6	11	5	6	12	**4	**5	11
Silver buffaloberry	---	**7	11	**7	11	11	---	**5	11	---	5	11
Skunkbush sumac	**3	5	8	**3	5	8	---	3	8	---	3	8
Tatarian honeysuckle	5	7	11	5	7	11	---	6	11	---	6	11
Western sandcherry	---	2	3	---	---	---	---	2	3	---	---	---

See footnotes at end of table.

TABLE 8A.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE I--Continued

Woody species	Group 6GKK			Group 6K			Group 6KK			Group 7		
	Precipitation			Precipitation			Precipitation			Precipitation		
	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers*:												
Austrian pine	---	---	---	---	---	13	---	---	---	---	**12	22
Black Hills spruce	---	---	14	---	---	14	---	---	15	---	---	20
Blue spruce	---	---	15	---	---	16	---	---	16	---	---	21
Eastern redcedar	6	7	14	**6	**7	15	**5	8	15	**7	9	20
Ponderosa pine	**8	11	17	**8	**10	17	**8	10	17	---	**11	22
Rocky Mountain juniper	7	8	14	**6	**10	14	**5	7	14	**6	8	18
Scotch pine	---	---	---	---	---	---	---	---	---	---	**12	20
Deciduous trees:												
Boxelder	---	---	---	---	---	---	---	---	---	---	---	20
Golden willow	---	---	---	---	---	---	---	---	---	---	---	---
Green ash	---	10	21	---	**11	21	---	11	22	---	12	28
Hackberry	---	---	18	---	---	18	---	9	20	---	---	24
Honeylocust	---	11	21	---	**11	21	---	11	21	---	13	26
Plains cottonwood	---	---	28	---	---	28	---	---	28	---	---	30
Russian-olive	8	8	18	---	**8	18	---	11	19	---	**13	23
Siberian crabapple	---	---	---	---	---	---	---	---	---	---	---	19
Siberian elm	**13	17	26	**12	**15	26	**11	14	25	---	16	29
Shrubs:												
American plum	---	---	8	---	---	8	---	---	7	---	---	10
Basin big sagebrush	2	3	---	3	4	---	2	2	---	---	---	---
Common chokecherry	---	---	9	---	**6	9	---	---	8	---	---	11
Fourwing saltbush	2	2	---	2	2	---	2	2	---	---	---	---
Golden currant	---	---	---	---	---	---	---	---	---	---	---	6
Greasewood	---	---	---	---	---	---	---	---	---	---	---	---
Lilac	---	**5	9	---	**4	7	---	**4	8	---	**5	9
Nanking cherry	---	---	---	---	---	---	---	---	---	---	---	7
Peking cotoneaster	---	---	---	---	---	---	---	---	---	---	---	8
Redosier dogwood	---	---	---	---	---	---	---	---	---	---	---	7
Rubber rabbitbrush	2	2	5	2	3	---	2	3	---	**2	3	---
Rugosa rose	---	---	---	---	---	---	---	---	---	**2	3	6
Saskatoon serviceberry	---	---	---	---	---	---	---	---	---	---	---	5
Siberian peashrub	**3	**4	9	**3	**4	9	---	**4	9	**4	6	12
Silver buffaloberry	---	**4	9	---	**4	9	---	**4	9	---	---	11
Skunkbush sumac	---	3	8	---	3	7	---	---	7	---	---	---
Tatarian honeysuckle	---	6	11	---	**5	9	---	**5	8	---	5	11
Western sandcherry	---	---	---	---	---	3	---	---	3	---	2	3

See footnotes at end of table.

TABLE 8A.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE I--Continued

Woody species	Group 8			Group 8K			Group 9C			Group 9L			Group 9W		
	Precipitation			Precipitation			Precipitation			Precipitation			Precipitation		
	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated	10-14"	15-19"	Irrigated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers*:															
Austrian pine	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Black Hills spruce	---	---	21	---	---	17	---	---	---	---	---	---	---	---	---
Blue spruce	---	---	21	---	---	17	---	---	---	---	---	---	---	---	---
Eastern redcedar	8	10	20	6	8	16	---	**6	17	---	**7	17	---	10	20
Ponderosa pine	**11	13	22	**10	12	20	**8	10	21	**9	11	21	---	---	---
Rocky Mountain juniper	8	10	17	8	10	18	**4	5	15	**5	6	15	**7	9	16
Scotch pine	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Deciduous trees:															
Boxelder	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Golden willow	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Green ash	11	13	30	9	11	24	---	**10	24	---	**11	24	---	16	27
Hackberry	---	---	26	---	---	21	---	---	---	---	---	---	---	---	---
Honeylocust	11	14	29	9	12	24	---	---	---	---	---	---	14	17	27
Plains cottonwood	---	---	41	---	---	33	---	---	35	---	---	35	---	27	41
Russian-olive	9	11	22	9	11	22	7	8	22	8	9	22	13	16	23
Siberian crabapple	---	---	---	---	---	---	---	---	---	8	---	---	---	---	---
Siberian elm	17	20	33	15	18	31	**9	11	26	**10	12	26	**10	13	29
Shrubs:															
American plum	---	---	10	---	---	8	---	---	---	---	---	---	---	---	---
Basin big sagebrush	3	---	---	2	---	---	---	---	---	4	---	---	---	---	---
Common chokecherry	---	7	11	---	6	9	---	---	---	---	---	---	---	---	---
Fourwing saltbush	2	---	---	2	---	---	---	---	---	3	---	---	2	2	---
Golden currant	---	---	---	---	---	---	---	---	---	---	---	---	3	4	---
Greasewood	---	---	---	---	---	---	---	---	---	3	---	---	3	2	---
Lilac	4	5	10	4	5	10	---	4	10	---	5	10	**5	6	10
Nanking cherry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Peking cotoneaster	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Redosier dogwood	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rubber rabbitbrush	2	---	---	2	---	---	---	---	---	3	---	---	2	3	---
Rugosa rose	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Saskatoon serviceberry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Siberian peashrub	5	6	12	4	5	10	3	4	10	4	5	10	5	8	12
Silver buffaloberry	---	6	12	---	6	12	---	4	11	---	5	11	---	7	11
Skunkbush sumac	3	5	8	3	5	9	---	3	9	3	4	9	3	5	9
Tatarian honeysuckle	5	7	11	5	7	11	3	4	11	4	5	11	6	7	11
Western sandcherry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* New plantings in areas that are subject to high winds require protection from the winds during the 3- to 5-year establishment period. A midwinter watering is recommended to prevent foliar desiccation.

** Supplemental water is needed during the 3- to 5-year establishment period.

TABLE 8B.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE II

(Dashes indicate that the species is not suited to the soils in the group)

Woody species	Group 1		Group 1KW		Group 2		Group 2KW		Group 3	
	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:										
Austrian pine-----------	---	22	---	---	---	22	---	---	---	22
Blue spruce-------------	15	22	---	22	14	22	---	22	---	22
Eastern redcedar--------	**16	23	15	22	16	23	16	22	10	21
Ponderosa pine----------	10	22	**16	23	**17	22	**17	23	**14	22
Rocky Mountain juniper--	10	21	10	21	11	21	**11	21	8	18
Scotch pine-------------	---	21	---	---	---	21	---	---	---	20
Deciduous trees:										
Boxelder----------------	---	21	---	---	---	21	---	---	---	20
Golden willow-----------	**20	31	**20	31	**22	31	**22	31	---	30
Green ash---------------	**14	28	**14	27	**16	28	**16	27	13	28
Honeylocust-------------	15	28	15	28	17	28	**17	28	14	27
Plains cottonwood-------	*28	41	**28	41	**30	41	**30	41	---	41
Russian olive-----------	16	24	16	24	18	24	**18	24	13	23
Siberian crabapple------	**11	19	---	---	**13	19	---	---	---	19
Siberian elm------------	**20	33	**20	33	**22	33	**22	33	**18	33
Shrubs:										
American plum-----------	**7	10	**7	10	**8	10	10	10	---	11
Basin big sagebrush-----	---	---	---	---	---	---	---	---	---	---
Common chokecherry------	**7	11	**7	11	**8	11	10	11	**6	11
Fourwing saltbush-------	2	3	2	3	2	3	2	3	2	---
Golden currant----------	---	6	---	---	**4	6	6	---	---	6
Greasewood--------------	---	---	3	---	---	---	3	---	---	---
Lilac-------------------	**5	10	**5	10	**6	10	**6	10	**5	10
Nanking cherry----------	**3	9	---	---	---	9	---	---	**3	8
Peking cotoneaster------	**3	8	---	---	**4	---	---	---	**3	8
Redosier dogwood--------	---	8	---	---	**4	8	---	---	---	8
Rubber rabbitbrush------	---	---	2	---	---	---	---	---	---	---
Rugosa rose-------------	2	6	---	---	3	6	2	---	3	6
Saskatoon serviceberry--	---	7	---	---	**4	7	---	---	---	5
Siberian peashrub-------	7	13	5	13	8	13	---	13	7	12
Silver buffaloberry-----	---	12	---	12	**5	12	**5	12	---	11
Skunkbush sumac---------	4	9	4	9	5	9	5	9	3	9
Tatarian honeysuckle----	6	11	5	11	7	11	6	11	5	11
Western sandcherry------	2	3	---	---	2	3	---	---	2	3

See footnote at end of table.

TABLE 8B.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE II

(Dashes indicate that the species is not suited to the soils in the group)

Woody species	Group 4		Group 4C		Group 4CK		Group 4K	
	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:								
Austrian pine	---	22	---	---	---	---	---	---
Blue spruce	---	20	---	19	---	18	---	19
Eastern redcedar	10	20	8	20	7	19	9	19
Ponderosa pine	12	22	**9	21	**9	21	12	22
Rocky Mountain juniper	8	18	8	18	8	18	8	18
Scotch pine	---	20	---	---	---	---	---	---
Deciduous trees:								
Boxelder	---	19	---	19	---	---	---	---
Golden willow	---	29	---	29	---	29	---	29
Green ash	**13	28	**10	25	**9	22	**12	26
Honeylocust	13	26	12	24	12	24	13	26
Plains cottonwood	---	41	---	41	---	41	---	41
Russian olive	11	23	9	22	9	22	11	23
Siberian crabapple	---	19	---	19	---	---	---	---
Siberian elm	**16	33	**15	31	**15	31	**16	33
Shrubs:								
American plum	---	10	---	10	---	10	---	10
Basin big sagebrush	---	---	---	---	---	---	---	---
Common chokecherry	**7	11	**7	11	**7	11	**7	11
Fourwing saltbush	2	3	2	3	2	3	2	3
Golden currant	---	6	---	6	---	---	---	---
Greasewood	---	---	---	---	---	---	---	---
Lilac	**5	10	**4	9	**4	9	**5	10
Nanking cherry	**3	8	**3	8	---	---	---	---
Peking cotoneaster	**3	8	---	8	---	---	---	---
Redosier dogwood	---	8	---	7	---	---	---	---
Rubber rabbitbrush	2	---	2	---	2	---	2	---
Rugosa rose	3	6	---	5	---	---	---	---
Saskatoon serviceberry	---	5	---	5	---	---	---	---
Siberian peashrub	6	12	4	9	4	9	5	11
Silver buffaloberry	---	10	---	10	---	10	---	10
Skunkbush sumac	3	9	---	8	---	8	3	9
Tatarian honeysuckle	5	11	4	11	4	11	5	11
Western sandcherry	2	3	---	3	---	---	---	---

See footnotes at end of table.

TABLE 8B.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE II

(Dashes indicate that the species is not suited to the soils in the group)

Woody species	Group 5		Group 5K		Group 5KK		Group 6	
	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:								
Austrian pine-----------	---	22	---	---	---	---	---	18
Blue spruce-------------	---	21	---	21	---	19	---	17
Eastern redcedar--------	10	20	8	20	7	18	6	16
Ponderosa pine----------	**13	22	**11	22	**9	20	**9	16
Rocky Mountain juniper--	8	17	8	17	7	15	*6	14
Scotch pine-------------	---	22	---	---	---	---	---	---
Deciduous trees:								
Boxelder----------------	---	20	---	---	---	---	---	16
Golden willow-----------	---	29	---	---	---	---	---	---
Green ash---------------	**12	26	**11	27	**9	22	---	23
Honeylocust-------------	12	26	11	28	9	23	---	21
Plains cottonwood-------	---	41	---	41	---	35	---	28
Russian olive-----------	11	23	9	23	8	21	8	18
Siberian crabapple------	---	19	---	---	---	---	---	14
Siberian elm------------	**17	33	**16	33	**15	30	**12	26
Shrubs:								
American plum-----------	---	10	---	10	---	8	---	6
Basin big sagebrush-----	3	---	3	---	3	---	3	---
Common chokecherry------	**6	11	---	11	---	9	---	7
Fourwing saltbush-------	2	---	2	---	2	---	2	---
Golden currant----------	---	6	---	---	---	---	---	5
Greasewood--------------	---	---	3	---	3	---	---	---
Lilac-------------------	**5	10	**4	10	**4	8	---	7
Nanking cherry----------	---	8	---	---	---	---	---	6
Peking cotoneaster------	---	8	---	---	---	---	---	7
Redosier dogwood--------	---	8	---	---	---	---	---	6
Rubber rabbitbrush------	3	---	2	---	2	---	3	---
Rugosa rose-------------	2	6	---	---	---	---	2	5
Saskatoon serviceberry--	---	5	---	---	---	---	---	4
Siberian peashrub-------	5	12	4	12	3	10	3	9
Silver buffaloberry-----	---	12	---	11	---	9	---	9
Skunkbush sumac---------	3	8	3	8	3	7	3	7
Tatarian honeysuckle----	5	11	4	11	3	9	---	8
Western sandcherry------	2	3	---	---	---	---	---	3

See footnotes at end of table.

TABLE 8B.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20,
BY SUITABILITY GROUP, IN PLANTING ZONE II

(Dashes indicate that the species is not suited to the soils in the group)

Woody species	Group 6D		Group 6DK		Group 6G		Group 6GK	
	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:								
Austrian pine	---	20	---	---	---	20	---	---
Blue spruce	---	17	---	17	---	18	---	19
Eastern redcedar	7	16	8	17	8	17	7	17
Ponderosa pine	**11	22	**11	22	**10	20	**10	22
Rocky Mountain juniper	7	15	8	15	7	15	7	15
Scotch pine	---	---	---	---	---	---	---	---
Deciduous trees:								
Boxelder	---	18	---	---	---	18	---	---
Golden willow	---	29	---	29	---	---	---	28
Green ash	**11	26	**9	25	---	26	---	26
Honeylocust	12	26	10	24	---	26	---	26
Plains cottonwood	---	35	---	35	---	35	---	35
Russian olive	11	22	11	22	10	22	10	22
Siberian crabapple	---	19	---	---	---	19	---	---
Siberian elm	**17	30	**15	30	**15	32	**15	30
Shrubs:								
American plum	---	10	---	10	---	10	---	8
Basin big sagebrush	3	---	3	---	3	---	3	---
Common chokecherry	---	11	---	11	---	11	---	10
Fourwing saltbush	2	---	2	---	2	---	2	---
Golden currant	---	6	---	---	---	6	---	---
Greasewood	---	---	---	---	---	---	---	---
Lilac	---	9	---	9	---	9	---	9
Nanking cherry	---	8	---	---	---	7	---	---
Peking cotoneaster	---	7	---	---	---	8	---	---
Redosier dogwood	---	7	---	---	---	7	---	---
Rubber rabbitbrush	3	---	3	---	3	---	3	---
Rugosa rose	2	6	---	---	2	6	---	---
Saskatoon serviceberry	---	5	---	---	---	5	---	---
Siberian peashrub	6	12	5	11	5	12	4	11
Silver buffaloberry	---	11	---	11	---	11	---	11
Skunkbush sumac	**3	8	**3	8	4	8	**3	8
Tatarian honeysuckle	**6	11	**6	11	---	11	**5	11
Western sandcherry	---	3	---	---	---	3	---	3

See footnotes at end of table.

TABLE 8B.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE II

(Dashes indicate that the species is not suited to the soils in the group)

Woody species	Group 6GKK		Group 6K		Group 6KK		Group 7	
	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:								
Austrian pine	---	---	---	---	---	---	---	22
Blue spruce	---	15	---	17	---	16	---	21
Eastern redcedar	6	14	6	16	**6	16	**8	20
Ponderosa pine	**8	18	**9	16	**7	17	---	22
Rocky Mountain juniper	6	14	*6	14	**6	15	**6	18
Scotch pine	---	---	---	---	---	---	---	---
Deciduous trees:								
Boxelder	---	---	---	---	---	---	---	20
Golden willow	---	22	---	---	---	---	---	---
Green ash	---	21	---	20	**7	20	---	28
Honeylocust	---	21	---	21	**8	21	---	26
Plains cottonwood	---	28	---	28	---	28	---	30
Russian olive	8	22	8	18	**8	18	---	23
Siberian crabapple	---	---	---	14	---	---	---	19
Siberian elm	13	29	**12	26	**12	26	---	32
Shrubs:								
American plum	**7	8	---	6	---	6	---	10
Basin big sagebrush	2	---	3	---	**2	---	---	---
Common chokecherry	**8	8	---	7	---	7	---	11
Fourwing saltbush	2	---	2	---	2	---	---	---
Golden currant	---	---	---	5	---	---	---	6
Greasewood	---	---	---	---	---	---	---	---
Lilac	**6	6	---	6	---	6	---	9
Nanking cherry	---	---	---	6	---	---	---	7
Peking cotoneaster	---	---	---	7	---	---	---	8
Redosier dogwood	---	---	---	6	---	---	---	7
Rubber rabbitbrush	2	---	3	---	2	---	3	---
Rugosa rose	---	---	---	---	---	---	---	6
Saskatoon serviceberry	---	---	---	---	---	---	---	5
Siberian peashrub	**3	9	**3	9	**3	9	---	12
Silver buffaloberry	---	8	---	8	---	8	---	11
Skunkbush sumac	**3	7	**3	7	**3	7	---	8
Tatarian honeysuckle	---	9	---	8	---	9	---	11
Western sandcherry	---	3	---	3	---	3	---	3

See footnotes at end of table.

TABLE 8B.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE II

(Dashes indicate that the species is not suited to the soils in the group)

Woody species	Group 8		Group 8K		Group 9C		Group 9L		Group 9W	
	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated	10-14" precipi-tation	Irri-gated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:										
Austrian pine	---	---	---	---	---	---	---	---	---	---
Blue spruce	---	21	---	19	---	---	---	---	---	---
Eastern redcedar	8	20	6	16	---	15	---	17	---	16
Ponderosa pine	**11	22	**9	18	**9	16	**10	21	---	---
Rocky Mountain juniper	8	17	7	15	**4	14	**5	16	**7	15
Scotch pine	---	---	---	---	---	---	---	---	---	---
Deciduous trees:										
Boxelder	---	---	---	---	---	---	---	---	---	---
Golden willow	---	30	---	28	---	---	---	---	---	---
Green ash	11	30	9	26	---	21	---	22	---	25
Honeylocust	11	29	9	26	---	---	---	---	14	27
Plains cottonwood	---	41	---	35	---	35	---	35	---	41
Russian olive	12	23	7	22	8	22	9	22	13	23
Siberian crabapple	---	---	---	---	---	---	---	---	---	---
Siberian elm	17	33	13	30	**9	30	**10	33	15	32
Shrubs:										
American plum	---	10	---	8	---	---	---	---	---	---
Basin big sagebrush	3	---	2	---	2	---	3	---	---	---
Common chokecherry	---	11	---	9	---	---	---	---	---	---
Fourwing saltbush	2	---	2	---	2	---	2	---	2	---
Golden currant	---	---	---	---	---	---	---	---	---	---
Greasewood	---	---	---	---	---	---	2	---	4	---
Lilac	4	10	3	9	---	8	---	8	**5	10
Nanking cherry	---	---	---	---	---	---	---	---	---	---
Peking cotoneaster	---	---	---	---	---	---	---	---	---	---
Redosier dogwood	---	---	---	---	---	---	---	---	---	---
Rubber rabbitbrush	3	---	3	---	2	---	2	---	3	---
Rugosa rose	---	---	---	---	---	---	---	---	---	---
Saskatoon serviceberry	---	---	---	---	---	---	---	---	---	---
Siberian peashrub	5	12	4	---	3	10	4	10	6	12
Silver buffaloberry	---	12	---	11	---	10	---	10	---	11
Skunkbush sumac	3	9	---	6	---	7	3	7	3	8
Tatarian honeysuckle	5	11	4	10	3	9	4	9	6	10
Western sandcherry	---	---	---	---	---	---	---	---	---	---

* New plantings in areas that are prone to high wind need protection from the wind during the 3- to 5- year establishment period. A midwinter watering is also recommended to prevent foliar dessication.

** Supplemental water is needed during the 3- to 5- year establishment period.

TABLE 8C.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE III

(Dashes indicate that the species is not suited to the soils in the group)

Woody species	Group 1				Group 1KW				Group 2				Group 2KW				Group 3			
	Precipitation				Precipitation				Precipitation				Precipitation				Precipitation			
	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:																				
Blue spruce	**14	16	20	22	**13	16	20	22	**15	17	21	22	**14	17	21	22	---	16	18	22
Douglas fir	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	20	25	26
Englemann spruce	**14	16	25	26	---	---	---	---	**15	17	26	26	---	---	---	---	---	16	18	22
Lodgepole pine	---	---	---	---	---	---	---	---	---	---	19	---	---	---	---	---	---	20	25	26
Ponderosa pine	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**12	16	18	24
Rocky Mountain juniper	**10	14	18	21	**10	14	18	21	---	---	---	---	---	---	---	---	9	10	12	20
Scotch pine	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	15	18	22
Subalpine fir	**12	15	19	15	---	---	---	---	**12	**13	15	15	---	---	---	---	---	---	13	13
White fir	**14	17	22	26	---	---	---	---	**15	18	23	26	---	---	---	---	---	---	---	---
Deciduous trees:																				
Boxelder	---	16	18	22	---	---	---	---	**14	17	19	22	---	---	---	---	---	14	16	22
Golden willow	**21	24	26	32	**19	23	26	32	**22	25	27	32	**21	24	27	32	---	---	---	32
Green ash	14	18	22	30	14	18	22	30	15	19	23	30	15	19	23	30	12	16	18	30
Narrowleaf cottonwood	**22	27	36	42	---	---	---	---	**25	29	38	42	---	---	---	---	---	---	---	38
Plains cottonwood	**22	27	36	42	**20	25	36	42	**25	29	38	42	**23	27	38	42	---	---	---	35
Russian olive	15	18	22	25	15	18	20	25	16	19	23	25	16	19	23	25	13	15	16	25
Siberian crabapple	**11	12	15	19	---	---	---	---	**12	13	16	19	---	---	---	---	---	12	15	19
Siberian elm	**20	27	28	36	**20	27	28	35	**22	29	30	36	**22	29	30	35	**20	26	28	35
White willow	**21	24	26	32	**19	23	26	32	**23	26	28	32	**23	26	28	32	---	---	---	32
Shrubs:																				
American plum	---	**6	7	11	---	**6	7	11	**4	**7	7	11	**4	**7	7	11	---	**6	7	11
Basin big sagebrush	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Common chokecherry	**7	8	8	12	**7	8	8	12	**8	9	9	12	**8	9	9	12	**7	8	9	12
Common snowberry	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Fourwing saltbush	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Golden currant	---	**4	4	4	---	---	---	---	**4	**4	4	4	---	---	---	---	---	4	4	4
Greasewood	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lilac	**4	6	6	10	**4	6	6	10	**5	7	7	10	**5	7	7	10	**4	6	7	10
Redosier dogwood	---	---	6	8	---	---	---	---	---	**6	7	8	---	---	---	---	---	---	5	6
Rocky Mountain maple	---	7	9	10	---	---	---	---	**7	8	9	10	---	---	---	---	---	---	---	---
Rubber rabbitbrush	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rugosa rose	3	4	4	4	3	4	4	4	**4	4	4	4	**4	4	4	4	4	4	4	4
Saskatoon serviceberry	---	4	4	4	---	---	---	---	**4	4	4	4	---	---	---	---	---	4	4	5
Siberian peashrub	5	7	7	10	5	7	7	10	6	8	8	10	6	8	8	10	5	7	7	9
Silver buffaloberry	---	**7	9	11	---	**7	9	11	**5	**8	9	11	**5	8	9	11	---	**7	8	11
Skunkbush sumac	3	5	6	7	3	5	6	7	4	6	6	7	4	6	6	7	3	5	6	7
Tatarian honeysuckle	5	6	7	11	5	6	7	11	6	7	8	11	6	7	8	11	5	7	8	11
Woods rose	3	4	4	4	3	4	4	4	---	4	4	4	4	4	4	4	4	---	---	---

See footnote at end of table.

TABLE 8C.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE III--Continued

Woody species	Group 4				Group 4C				Group 4CK				Group 4K			
	Precipitation				Precipitation				Precipitation				Precipitation			
	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:																
Blue spruce	---	14	17	22	---	---	16	20	---	---	15	19	---	13	16	21
Douglas fir	---	16	20	26	---	---	---	---	---	---	---	---	---	---	---	---
Englemann spruce	---	14	16	22	---	---	17	20	---	---	---	---	---	---	---	---
Lodgepole pine	---	16	20	26	---	---	---	---	---	---	---	---	---	---	---	---
Ponderosa pine	**12	15	17	24	**10	12	14	22	**9	11	13	21	**11	14	16	23
Rocky Mountain juniper	9	11	13	20	9	10	12	20	9	10	12	20	9	11	13	20
Scotch pine	---	---	15	22	---	---	---	20	---	---	---	---	---	---	---	---
Subalpine fir	---	---	12	12	---	---	---	---	---	---	---	---	---	---	---	---
White fir	---	---	12	12	---	---	---	---	---	---	---	---	---	---	---	---
Deciduous trees:																
Boxelder	---	**13	15	22	---	---	---	20	---	---	---	---	---	---	---	---
Golden willow	---	---	---	32	---	---	---	28	---	---	---	26	---	---	---	30
Green ash	13	15	17	30	11	12	14	27	10	11	13	25	12	14	16	28
Narrowleaf cottonwood	---	---	---	35	---	---	---	32	---	---	---	---	---	---	---	---
Plains cottonwood	---	---	---	36	---	---	---	33	---	---	---	33	---	---	---	36
Russian olive	11	13	16	25	10	11	13	22	10	11	13	25	11	13	16	22
Siberian crabapple	---	13	16	20	---	12	15	19	---	---	---	---	---	---	---	---
Siberian elm	**19	24	26	36	**19	21	24	32	**19	21	24	32	**19	24	26	36
White willow	---	---	---	32	---	---	---	27	---	---	---	25	---	---	---	30
Shrubs:																
American plum	---	**6	7	11	---	**6	6	9	---	**6	6	9	---	**6	7	11
Basin big sagebrush	---	---	---	---	2	3	---	---	2	3	---	---	---	---	---	---
Common chokecherry	**7	8	8	12	**7	8	8	11	**7	8	8	11	**7	8	8	12
Common snowberry	3	3	3	3	---	---	---	---	---	---	---	---	3	3	3	3
Fourwing saltbush	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Golden currant	---	3	4	4	---	3	3	4	---	---	---	---	---	---	---	4
Greasewood	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lilac	**4	6	7	10	**4	5	6	10	**4	5	6	10	**4	6	7	10
Redosier dogwood	---	---	6	7	---	---	---	7	---	---	---	---	---	---	---	7
Rocky Mountain Maple	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rubber rabbitbrush	---	---	---	---	2	3	---	---	2	3	3	---	---	---	---	---
Rugosa rose	3	4	4	4	---	3	3	4	---	3	3	4	3	4	4	4
Saskatoon serviceberry	---	---	4	5	---	---	---	---	---	---	---	---	---	---	---	5
Siberian peashrub	6	7	8	9	4	5	7	8	---	---	---	---	---	---	---	---
Silver buffaloberry	---	**7	9	11	---	**5	7	11	---	**5	8	11	---	**7	9	11
Skunkbush sumac	4	6	6	7	3	4	5	6	3	4	5	6	4	6	6	7
Tatarian honeysuckle	5	6	9	11	4	6	8	11	4	6	8	11	5	6	9	11
Woods rose	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 8C.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE III--Continued

Woody species	Group 5				Group 5K				Group 5KK				Group 6			
	Precipitation				Precipitation				Precipitation				Precipitation			
	10-14"	15-19"	20+"	Irri-gated	10-14"	15-19"	20+"	Irri-gated	10-14"	15-19"	20+"	Irri-gated	10-14"	15-19"	20+"	Irri-gated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:																
Blue spruce	---	16	20	22	---	---	16	20	---	---	16	20	---	---	11	14
Douglas fir	---	---	18	24	---	---	---	---	---	---	---	---	---	---	---	---
Englemann spruce	---	17	21	24	---	---	---	---	---	---	---	---	---	---	11	14
Lodgepole pine	---	17	22	26	---	---	---	---	---	---	---	---	---	---	13	18
Ponderosa pine	**12	17	19	24	**10	12	14	22	**10	12	14	22	**8	**11	13	18
Rocky Mountain juniper	9	11	13	18	9	10	12	17	9	10	12	17	**7	**8	9	14
Scotch pine	---	---	18	22	---	---	---	---	---	---	---	---	---	---	---	17
Subalpine fir	---	---	13	13	---	---	---	---	---	---	---	---	---	---	---	---
White fir	---	---	18	24	---	---	---	---	---	---	---	---	---	---	---	18
Deciduous trees:																
Boxelder	---	---	16	20	---	---	---	---	---	---	---	---	---	---	---	18
Golden willow	---	---	---	25	---	---	---	25	---	---	---	25	---	---	---	---
Green ash	12	16	18	26	11	14	16	26	10	12	14	26	---	**9	13	21
Narrowleaf cottonwood	---	---	---	33	---	---	---	31	---	---	---	31	---	---	---	---
Plains cottonwood	---	---	---	33	---	---	---	31	---	---	---	31	---	---	---	26
Russian olive	12	14	18	25	11	13	17	25	10	12	16	25	**8	**9	13	19
Siberian crabapple	---	12	14	18	---	---	---	---	---	---	---	---	---	---	---	---
Siberian elm	**18	24	26	33	**17	21	24	31	**17	21	24	31	---	**15	19	23
White willow	---	---	---	27	---	---	---	27	---	---	---	27	---	---	---	---
Shrubs:																
American plum	---	**5	7	10	---	---	---	11	---	---	---	11	---	---	6	7
Basin big sagebrush	2	3	---	---	3	3	---	---	3	3	---	---	2	2	2	---
Common chokecherry	**7	8	9	11	---	7	9	10	---	7	9	10	---	**7	7	9
Common snowberry	---	3	3	3	---	3	3	3	---	3	3	3	---	---	---	---
Fourwing saltbush	---	---	---	---	2	2	---	---	2	2	---	---	---	---	---	---
Golden currant	---	**3	4	4	---	---	---	---	---	---	---	---	---	---	3	3
Greasewood	---	---	---	---	3	3	---	---	3	3	---	---	---	---	---	---
Lilac	**5	6	7	9	**5	6	7	9	**5	6	7	9	---	**3	5	7
Redosier dogwood	---	---	6	6	---	---	---	---	---	---	---	---	---	---	---	---
Rocky Mountain Maple	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rubber rabbitbrush	---	---	---	---	2	---	---	---	2	---	---	---	---	---	---	---
Rugosa rose	3	4	4	4	4	---	---	---	4	---	---	---	---	---	3	3
Saskatoon serviceberry	---	---	4	5	---	---	---	---	---	---	---	---	---	---	3	5
Siberian peashrub	6	7	8	9	6	7	7	9	6	7	7	9	**4	**5	5	7
Silver buffaloberry	---	**7	8	11	---	**6	8	11	---	**6	8	11	---	**5	6	8
Skunkbush sumac	3	5	6	6	4	5	5	6	4	5	5	6	---	**3	5	6
Tatarian honeysuckle	4	6	8	11	5	7	8	11	5	7	8	11	**4	**6	6	9
Woods rose	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 8C.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE III--Continued

Woody species	Group 6D				Group 6DK				Group 6G				Group 6GK			
	Precipitation				Precipitation				Precipitation				Precipitation			
	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated	10-14"	15-19"	20+"	Irrigated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:																
Blue spruce	---	---	14	18	---	---	13	16	---	---	14	18	---	---	13	16
Douglas fir	---	---	18	20	---	---	---	---	---	---	18	20	---	---	---	---
Englemann spruce	---	---	16	20	---	---	---	---	---	---	14	18	---	---	---	---
Lodgepole pine	---	16	19	25	---	---	---	---	---	---	16	22	---	---	---	---
Ponderosa pine	**10	14	15	20	**10	14	15	20	**10	14	15	20	9	12	14	18
Rocky Mountain juniper	9	11	13	18	8	10	12	18	9	11	13	18	9	10	12	18
Scotch pine	---	---	18	21	---	---	---	---	---	---	18	21	---	---	---	---
Subalpine fir	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
White fir	---	---	17	21	---	---	---	---	---	---	17	22	---	---	---	---
Deciduous trees:																
Boxelder	---	---	---	20	---	---	---	---	---	---	---	18	---	---	---	---
Golden willow	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Green ash	9	11	13	22	9	11	13	22	9	11	13	22	9	11	13	22
Narrowleaf cottonwood	---	---	---	30	---	---	---	30	---	---	---	30	---	---	---	30
Plains cottonwood	---	---	---	32	---	---	---	29	---	---	---	30	---	---	---	29
Russian olive	11	13	15	22	11	13	15	22	10	12	14	23	10	12	14	23
Siberian crabapple	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Siberian elm	**16	20	24	29	**16	20	24	29	**16	20	24	29	**16	20	24	29
White willow	---	---	---	27	---	---	---	24	---	---	---	27	---	---	---	27
Shrubs:																
American plum	---	---	6	8	---	---	6	8	---	---	6	8	---	---	6	8
Basin big sagebrush	3	3	---	---	3	3	---	---	3	3	---	---	3	3	---	---
Common chokecherry	---	7	8	11	---	7	8	11	---	7	8	11	---	7	8	11
Common snowberry	---	2	3	3	---	2	3	3	---	---	---	---	---	---	---	---
Fourwing saltbush	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Golden currant	---	3	3	4	---	---	---	---	---	---	4	4	---	---	---	---
Greasewood	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lilac	**5	5	6	9	---	5	6	9	---	5	6	9	---	5	6	9
Redosier dogwood	---	---	6	8	---	---	---	---	---	---	6	8	---	---	---	---
Rocky Mountain Maple	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rubber rabbitbrush	2	3	---	---	---	---	---	---	2	3	---	---	2	3	---	---
Rugosa rose	---	3	3	4	---	---	---	---	---	3	4	4	---	---	---	---
Saskatoon serviceberry	---	---	4	5	---	---	---	---	---	4	6	---	---	---	---	---
Siberian peashrub	**4	5	7	8	**4	5	7	8	**4	5	6	8	**4	5	6	8
Silver buffaloberry	---	**7	8	11	---	**7	8	11	---	**7	8	11	---	**7	8	11
Skunkbush sumac	**3	4	5	8	3	4	5	8	---	3	5	6	---	3	5	6
Tatarian honeysuckle	**5	7	8	11	**4	6	7	10	**5	7	8	11	**4	6	7	10
Woods rose	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 8C.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE III--Continued

Woody species	Group 6GKK				Group 6K				Group 6KK				Group 7			
	Precipitation				Precipitation				Precipitation				Precipitation			
	10-14"	15-19"	20+"	Irri-gated	10-14"	15-19"	20+"	Irri-gated	10-14"	15-19"	20+"	Irri-gated	10-14"	15-19"	20+"	Irri-gated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:																
Blue spruce	---	---	---	14	---	---	11	14	---	---	---	---	---	13	15	19
Douglas fir	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Englemann spruce	---	---	---	---	---	---	---	---	---	---	---	---	---	13	15	19
Lodgepole pine	---	---	---	---	---	---	---	---	---	---	---	---	---	13	15	20
Ponderosa pine	9	12	14	19	8	11	13	19	**8	11	13	18	**10	**13	17	22
Rocky Mountain juniper	8	9	11	17	7	8	9	14	7	8	9	14	**8	**9	11	16
Scotch pine	---	---	---	---	---	---	---	---	---	---	---	---	---	---	17	20
Subalpine fir	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11	12
White fir	---	---	---	---	---	---	---	---	---	---	---	---	---	---	16	22
Deciduous trees:																
Boxelder	---	---	---	---	---	---	---	---	---	---	---	---	---	---	14	19
Golden willow	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	25
Green ash	8	10	12	21	---	**9	11	20	---	**8	11	20	---	**10	14	23
Narrowleaf cottonwood	---	---	---	27	---	---	---	27	---	---	---	25	---	---	---	---
Plains cottonwood	---	---	---	26	---	---	---	26	---	---	---	25	---	---	---	26
Russian olive	9	11	13	22	8	10	14	30	8	10	12	20	---	**9	13	19
Siberian crabapple	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Siberian elm	**15	19	23	28	---	15	20	25	---	15	20	25	---	**15	19	23
White willow	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	25
Shrubs:																
American plum	---	---	6	8	---	---	6	8	---	---	5	7	---	5	6	9
Basin big sagebrush	3	3	---	---	3	3	---	---	3	3	---	---	2	3	3	---
Common chokecherry	---	**6	7	10	---	**5	7	10	---	**5	7	10	**6	7	8	10
Common snowberry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	3
Fourwing saltbush	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Golden currant	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	3
Greasewood	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lilac	---	**4	6	8	---	**4	6	8	---	**4	6	8	**3	4	6	8
Redosier dogwood	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rocky Mountain Maple	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rubber rabbitbrush	2	3	---	---	2	3	---	---	2	3	---	---	---	---	---	---
Rugosa rose	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	3
Saskatoon serviceberry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3	5
Siberian peashrub	**3	4	5	7	---	4	5	7	---	**5	5	7	**5	**6	6	7
Silver buffaloberry	---	**6	7	10	---	**6	8	10	---	**6	8	10	---	**6	7	10
Skunkbush sumac	---	**3	5	6	---	**3	5	6	---	**3	5	6	---	**4	4	6
Tatarian honeysuckle	**4	6	7	10	---	4	5	8	---	5	5	8	**4	**6	7	10
Woods rose	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 8C.--EXPECTED HEIGHTS OF SELECTED WOODY SPECIES AT AGE 20, BY SUITABILITY GROUP, IN PLANTING ZONE III

(Dashes indicate that the species is not suited to the soils in the group)

Woody species	Group 8 Precipitation 10-14"	Group 8 Precipitation 15-19"	Group 8 Precipitation 20+"	Group 8 Irrigated	Group 8K Precipitation 10-14"	Group 8K Precipitation 15-19"	Group 8K Precipitation 20+"	Group 8K Irrigated	Group 9C Precipitation 10-14"	Group 9C Precipitation 15-19"	Group 9C Precipitation 20+"	Group 9C Irrigated	Group 9L Precipitation 10-14"	Group 9L Precipitation 15-19"	Group 9L Precipitation 20+"	Group 9L Irrigated	Group 9W Precipitation 10-14"	Group 9W Precipitation 15-19"	Group 9W Precipitation 20+"	Group 9W Irrigated
	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
Conifers:																				
Blue spruce	---	14	16	21	---	---	16	21	---	---	---	---	---	---	---	---	---	---	---	---
Douglas fir	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Englemann spruce	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lodgepole pine	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ponderosa pine	**11	12	17	22	**10	12	17	22	---	---	---	---	---	---	---	---	---	---	---	---
Rocky Mountain juniper	8	10	13	18	8	10	13	18	**7	8	9	16	**7	8	9	16	**8	9	10	16
Scotch pine	---	14	17	21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Subalpine fir	---	---	13	13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
White fir	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Deciduous trees:																				
Boxelder	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Golden willow	---	---	---	27	---	---	---	26	---	---	---	23	---	---	---	23	---	---	23	28
Green ash	12	15	17	29	11	13	16	29	---	**11	14	26	---	**11	14	26	---	13	17	28
Narrowleaf cottonwood	---	---	---	32	---	---	---	32	---	---	---	30	---	---	---	30	---	---	---	33
Plains cottonwood	---	---	---	35	---	---	---	35	---	---	---	35	---	---	---	35	---	---	---	42
Russian olive	13	15	16	25	13	15	16	25	**9	12	16	24	**9	12	16	24	12	14	18	26
Siberian crabapple	---	12	15	19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Siberian elm	**18	24	28	33	**18	20	28	33	**15	20	22	28	**15	20	22	28	**16	22	24	30
White willow	---	---	---	30	---	---	---	28	---	---	---	27	---	---	---	27	---	---	27	30
Shrubs:																				
American plum	---	**6	7	11	---	**5	7	10	---	---	---	---	---	---	---	---	---	---	---	---
Basin big sagebrush	3	3	---	---	3	3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Common chokecherry	**7	8	9	12	**7	8	9	12	---	---	---	---	---	---	---	---	---	---	---	---
Common snowberry	---	3	3	3	---	3	3	3	---	---	---	---	---	---	---	---	---	---	---	---
Fourwing saltbush	2	---	---	---	2	2	---	---	2	2	---	---	2	2	---	---	3	3	---	---
Golden currant	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Greasewood	---	---	---	---	---	---	---	---	2	4	---	---	2	4	---	---	3	4	---	---
Lilac	**5	6	7	10	**5	6	7	10	**5	6	7	10	**4	5	6	9	**5	6	8	10
Redosier dogwood	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rocky Mountain maple	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Rubber rabbitbrush	2	---	---	---	2	3	---	---	2	2	---	---	2	2	---	---	2	2	---	---
Rugosa rose	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Saskatoon serviceberry	---	---	5	6	---	---	4	6	---	---	---	---	---	---	---	---	---	---	---	---
Siberian peashrub	6	7	8	9	5	6	7	9	---	---	---	---	---	---	---	---	---	---	---	---
Silver buffaloberry	---	**7	8	11	---	**5	7	10	---	7	8	11	---	**6	7	11	---	**6	7	10
Skunkbush sumac	3	5	6	7	3	5	6	7	---	5	6	7	---	5	6	7	---	5	6	7
Tatarian honeysuckle	5	7	8	11	5	7	8	11	4	5	6	10	4	5	6	10	4	5	6	10
Woods rose	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

** Supplemental water is needed during the 3- to 5-year establishment period.

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES

Soil name and map symbol	Suitability group	Planting zone
100:		
Aberone	6KK	I
101:		
Abston	10	II
Bullock	10	II
102:		
Alcova	6G	II
Borollic Camborthids	---	---
103:		
Alcova, shallow substratum	6G	II
Lupinto	6GKK	II
Dahlquist	6	II
104:		
Alcova, calcareous subsoil	6G	II
Rock River	5	II
105 Almy	3	II
106*:		
Almy	3	II
Urban land	---	---
107*:		
Almy	8	II
Tismid	9L	II
108 Alogia	9W	II
109*:		
Alogia	9W	II
Urban land	---	---
110 Anchutz	8	II
111:		
Ansel	5	III
Granile	6	III
112*:		
Bateson	6G	II
Shirleybasin	4CK	II

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
113:		
Blackhall	10	II
Browtine, moist	6KK	II
114*:		
Blackhall	10	II
Santanka	6DK	II
Rock outcrop.		
115:		
Blazon	10	II
Chaperton	6DK	II
116:		
Blazon	10	II
Delphill	6DK	II
117*:		
Bonjea	10	III
Chugcreek	6D	III
Rock outcrop.		
118:		
Bonjea	10	III
Rock outcrop.		
Chugcreek	6D	III
119 Bosler, wet substratum	2KW	II
120:		
Bosler	6GK	II
Borollic Camborthids	6G	II
121*:		
Bosler, wet substratum	2KW	II
Urban land	---	---
122:		
Boyle	10	III
Alderon	6D	III
Cathedral	10	III
123:		
Boyle	10	III
Boyle, thin solum	10	III

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
124*:		
Boyle	10	III
Rock outcrop.		
125*:		
Boyle	10	III
Lininger	6D	III
126 Browtine	6KK	II
127:		
Browtine	6KK	II
Hilltoppe	10	II
128*:		
Bruja	10	II
Canwall	10	II
Telecan	8	II
129:		
Buffork	6	III
Bucklon	10	III
130*:		
Byrnie	10	II
Rock outcrop.		
131 Calciborolls	6GKK	II
132 Canburn	10	II
133 Cantle	10	II
134*:		
Carbol	10	III
Rock outcrop.		
135:		
Carmody	6K	II
Edlin	3	II
136:		
Carmody	6K	II
Ryan Park	3	II
137*:		
Cathedral	10	II

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
137*:		
Spinekop	8	II
Rock outcrop.		
138	2	II
Center Creek		
139:		
Chaperton, moderately saline	6DK	II
Blazon	10	II
140:		
Chaperton	6DK	II
Poposhia	8	II
141*:		
Cheadle	10	III
Passcreek, cobbly subsoil	6K	III
Rock outcrop.		
142:		
Cheadle	10	III
Rock outcrop.		
Miracle	6D	III
143.		
Cryaquolls	10	III
144.		
Cryoborolls	3	III
145:		
Cushool	6D	II
Cutback	6K	II
146:		
Cushool	6D	II
Diamondville	6D	II
147:		
Cutback	6K	II
Pinelli	4C	II
148:		
Dahlquist	6	II
Rawlins	5K	II
Browtine	5KK	II

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
149:		
Dalecreek	2KW	III
Kovich	10	III
150:		
Delphill	6DK	II
Blazon	10	II
151:		
Diamondville	6D	II
Cushool	6D	II
152:		
Diamonkit	9L	II
Stylite	5K	II
153 Elkol	9C	II
154*, 155*:		
Elkol	9C	II
Gerdrum Family	10	II
156 Evanston	3	III
157:		
Evanston	3	III
Bonjea	10	III
158:		
Fiveoh	5K	II
Fiveoh, cobbly substratum	5KK	II
Ryan Park	5	II
159*:		
Fiveoh	5K	II
Fiveoh, cobbly substratum	5KK	II
Urban land.		
160:		
Fiveoh, cobbly substratum	5KK	II
Joemre	8	II
161 Folavar	10	II

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
162:		
Folavar	10	II
Borollic Camborthids	10	II
163 Forelle	3	II
164*:		
Forelle	3	II
Urban land.		
165*:		
Forelle	3	II
Diamondville	6D	II
166:		
Glendive	1K	II
Redrob	2KW	II
Grenoble	6	II
167:		
Grenoble	6	II
Gerrard	10	II
168 Greyback	10	III
169 Gypla	10	II
170*:		
Gypla	10	II
Urban land.		
171:		
Hanson	5K	III
Quander	5	III
172:		
Hapjack	10	III
Rogert	10	III
Amesmont	6	III
173:		
Ipson	5	III
Evanston	3	III
174, 175 Joemre	8	II

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
176*:		
Kezar	6	III
Carbol	10	III
Rock outcrop.		
177:		
Kildor	4	III
Rock outcrop.		
178:		
Kiltabar	10	II
Tismid	9L	II
179:		
Lakehelen	6	III
Redfeather	10	III
Amesmont	6	III
180 Leavitt	5	III
181:		
Leavitt	5	III
Granile	6	III
182:		
Leavitt	3	III
Hanson	5K	III
183:		
Leavitt	3	III
Quander	5	III
184 Luhon	8K	II
185:		
Luvar	9L	II
Stylite	9L	II
Diamonkit	9L	II
186:		
Lymanson loam	6D	III
Lymanson cobbly loam	6D	III
187 Manada	1KW	II
188 McFadden	5K	II

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
189*:		
Miracle	6D	III
Cheadle	10	III
190:		
Moyerson	10	II
Kemmerer	4CK	II
191*:		
Nathale	10	III
Passcreek, cobbly subsoil	6K	III
Rock outcrop.		
192 Pahlow	10	II
193:		
Pilotpeak	10	II
Canwall	10	II
194 Pahlow	4C	II
195* Pits, mine.		
196*:		
Poin	10	III
Bowen	6	III
Rock outcrop.		
197:		
Poposhia	8	II
Blazon	10	II
198:		
Poposhia	8	II
Forelle	3	II
199*:		
Poposhia	8	II
Chaperton	6DK	II
200*:		
Rainbolt	6DK	III
Morset	5K	III
201:		
Redfeather	10	III

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
201:		
Lakehelen	6	III
Rogert	10	III
202 Redrob	2KW	II
203:		
Redrob, frequently flooded	10	II
Grenoble	6	II
Redrob	2KW	II
204:		
Redrob, frequently flooded	10	II
Redrob	2KW	II
205*:		
Redrob, frequently flooded	10	II
Redrob	2KW	II
Urban land.		
206:		
Rentsac	10	II
Wycolo	6K	II
207:		
Renvers	10	II
Chalkhill	10	II
208:		
Rimton	6D	III
Passcreek, cobbly subsoil	6K	III
Miracle	6D	III
209* Riverwash	---	---
210:		
Rock outcrop.		
Bonjea	10	II
211:		
Rock outcrop.		
Bruja	10	II
Byrnie	10	II

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
212:		
Rock outcrop.		
Cathedral	10	III
213:		
Rock outcrop.		
Cathedral	10	III
Alderon	6D	III
214:		
Rock outcrop.		
Pilotpeak	10	II
215:		
Rock outcrop.		
Rogert	10	II
216, 217 Rock River	3	II
218*:		
Rock River	3	II
Urban land.		
219*:		
Rogert	10	III
Lakehelen	6	III
Rock outcrop.		
220:		
Rogert	10	III
Rock outcrop.		
Amesmont	6	III
221 Rohonda	6R	II
222:		
Rohonda	6DK	II
Tieside	10	II
223*:		
Rohonda	6DK	II
Cheadle	10	III
Rock outcrop.		
224 Ryark	5	II

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
225:		
Shirleybasin	4CK	II
Twocabin	6G	II
Lahtida	4CK	II
226 Silas	2	III
227:		
Silas, gravelly substratum	2	III
Vensora	10	III
228 Stunner	3	II
229:		
Stunner	3	II
Borollic Camborthids	5K	II
230:		
Stunner	8	II
Tisworth	9L	II
Blazon	10	II
231*:		
Stunner	3	II
Urban land.		
232 Teeler	5	III
233:		
Thiel	10	III
Lymanson	6DK	III
Leavitt	3	III
234*:		
Tieside	10	II
Pilotpeak	10	II
Rock outcrop.		
235 Tismid	9L	II
236*, 237*:		
Tisworth	9L	II
Gerdrum Family	10	II

TABLE 9.--WINDBREAK SUITABILITY GROUPS AND PLANTING ZONES--Continued

Soil name and map symbol	Suitability group	Planting zone
238:		
Tule	10	II
Chalkville	10	II
239*:		
Tyzak	10	III
Rock outcrop.		
240 Wycolo	6D	II
241:		
Wycolo	6D	II
Alcova	6G	II
242*:		
Wycolo	6D	II
Alcova	6G	II
Urban land.		
243:		
Wycolo	6DK	II
Tieside	10	II
244*:		
Wycolo	6K	II
Thermopolis	10	II
Rock outcrop.		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
100 Aberone	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight.
101*:				
Abston	Severe: slope, excess sodium.	Severe: slope, excess sodium.	Severe: slope, excess sodium.	Moderate: slope, dusty.
Bullock	Severe: slope, excess sodium.	Severe: slope, excess sodium.	Severe: slope, excess sodium.	Moderate: slope.
102*:				
Alcova	Slight	Slight	Moderate: slope.	Slight.
Borollic Camborthids.				
103*:				
Alcova, shallow substratum	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
Lupinto	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
Dahlquist	Severe: small stones.	Severe: small stones.	Severe: small stones.	Moderate: dusty.
104*:				
Alcova, calcareous subsoil	Slight	Slight	Moderate: slope.	Slight.
Rock River	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.
105 Almy	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
106*:				
Almy	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
Urban land.				
107*:				
Almy	Slight	Slight	Slight	Slight.
Tismid	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
108 Alogia	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
109*:				
Alogia	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
Urban land.				
110 Anchutz	Slight	Slight	Moderate: slope.	Slight.
111*:				
Ansel	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Granile	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
112*:				
Bateson	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
Shirleybasin	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
113*:				
Blackhall	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones.
Browtine, moist	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.
114*:				
Blackhall	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
Satanka	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Rock outcrop.				
115*:				
Blazon	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
Chaperton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
116*:				
Blazon	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Delphill	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
117*:				
Bonjea	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
Chugcreek	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Rock outcrop.				
118*:				
Bonjea	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Rock outcrop.				
Chugcreek	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
119 Bosler, wet substratum	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
120*:				
Bosler	Slight	Slight	Moderate: slope, small stones.	Slight.
Borollic Camborthids.				
121*:				
Bosler, wet substratum	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.				
122*:				
Boyle	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.
Alderon	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
122*:				
Cathedral	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones.	Moderate: slope.
123*:				
Boyle	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, depth to rock.	Slight.
Boyle, thin solum	Severe: depth to rock.	Severe: depth to rock.	Severe: small stones, depth to rock.	Slight.
124*:				
Boyle	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.
Rock outcrop.				
125*:				
Boyle	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight.
Lininger	Slight	Slight	Moderate: slope, depth to rock.	Slight.
126 Browtine	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.
127*:				
Browtine	Severe: small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.
Hilltoppe	Severe: small stones, cemented pan.	Severe: small stones, cemented pan.	Severe: small stones, cemented pan.	Slight.
128*:				
Bruja	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: slope.
Canwall	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
Telecan	Slight	Slight	Moderate: slope, small stones.	Slight.
129*:				
Buffork	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
129*:				
Bucklon	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
130*:				
Byrnie	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Rock outcrop.				
131. Calciborolls				
132 Canburn	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
133 Cantle	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
134*:				
Carbol	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Rock outcrop.				
135*:				
Carmody	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Edlin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
136*:				
Carmody	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Ryan Park	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
137*:				
Cathedral	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones.	Severe: slope.
Spinekop	Slight	Slight	Moderate: slope.	Slight.
Rock outcrop.				
138 Center Creek	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
139*:				
Chaperton, moderately saline	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Moderate: dusty.
Blazon	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
140*:				
Chaperton	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: slope.
Poposhia	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.	Moderate: large stones, slope.
141*:				
Cheadle	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: large stones, slope, depth to rock.	Moderate: slope.
Passcreek, cobbly subsoil	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Rock outcrop.				
142*:				
Cheadle	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.
Rock outcrop.				
Miracle	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
143. Cryaquolls				
144. Cryoborolls				
145*:				
Cushool	Slight	Slight	Severe: slope.	Slight.
Cutback	Slight	Slight	Severe: slope.	Slight.
146*:				
Cushool	Slight	Slight	Moderate: small stones.	Slight.
Diamondville	Slight	Slight	Slight	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
147*:				
Cutback	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
Pinelli	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
148*:				
Dahlquist	Severe: small stones.	Severe: small stones.	Severe: small stones.	Slight.
Rawlins	Slight	Slight	Moderate: slope.	Slight.
Browtine	Severe: large stones.	Severe: large stones.	Severe: large stones, slope, small stones.	Moderate: large stones.
149*:				
Dalecreek	Severe: flooding.	Slight	Moderate: slope.	Slight.
Kovich	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
150*:				
Delphill	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Slight.
Blazon	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: erodes easily.
151*:				
Diamondville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Cushool	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
152*:				
Diamonkit	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Stylite	Slight	Slight	Moderate: slope.	Slight.
153 Elkol	Moderate: excess salt.	Moderate: excess salt.	Moderate: slope, excess salt.	Slight.
154*:				
Elkol	Moderate: excess salt.	Moderate: excess salt.	Moderate: slope, excess salt.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
154*:				
Gerdrum Family	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Moderate: dusty.
155*:				
Elkol	Moderate: excess salt.	Moderate: excess salt.	Moderate: excess salt.	Slight.
Gerdrum Family	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Moderate: dusty.
156 Evanston	Slight	Slight	Moderate: slope.	Slight.
157*:				
Evanston	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, dusty.
Bonjea	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
158*:				
Fiveoh	Slight	Slight	Moderate: slope, small stones.	Slight.
Fiveoh, cobbly substratum	Slight	Slight	Moderate: slope.	Slight.
Ryan Park	Slight	Slight	Moderate: slope.	Slight.
159*:				
Fiveoh, cobbly substratum	Slight	Slight	Moderate: slope.	Slight.
Fiveoh	Slight	Slight	Moderate: slope, small stones.	Slight.
Urban land.				
160*:				
Fiveoh, cobbly substratum	Slight	Slight	Moderate: slope.	Slight.
Joemre	Slight	Slight	Moderate: slope.	Slight.
161 Folavar	Severe: small stones, wetness.	Severe: wetness, small stones.	Severe: small stones, wetness.	Severe: wetness.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
162*:				
Folavar	Severe: small stones, wetness.	Severe: wetness, small stones.	Severe: small stones, wetness.	Severe: wetness.
Borollic Camborthids.				
163 Forelle	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
164*:				
Forelle	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
Urban land.				
165*:				
Forelle	Slight	Slight	Moderate: slope.	Slight.
Diamondville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
166*:				
Glendive	Severe: flooding.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
Redrob	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
Grenoble	Severe: flooding.	Moderate: flooding, wetness, small stones.	Severe: small stones, flooding.	Moderate: flooding.
167*:				
Grenoble	Severe: flooding.	Moderate: flooding, wetness, small stones.	Severe: small stones, flooding.	Moderate: flooding.
Gerrard	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
168 Greyback	Severe: large stones.	Severe: large stones.	Severe: large stones, small stones.	Moderate: large stones.
169 Gypla	Severe: excess salt.	Severe: excess salt.	Severe: excess salt.	Moderate: wetness, dusty.
170*:				
Gypla	Severe: excess salt.	Severe: excess salt.	Severe: excess salt.	Moderate: wetness, dusty.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
170*:				
Urban land.				
171*:				
Hanson	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
Quander	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
172*:				
Hapjack	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.
Rogert	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.
Amesmont	Slight	Slight	Severe: slope.	Slight.
173*:				
Ipson	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
Evanston	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
174 Joemre	Slight	Slight	Moderate: slope.	Slight.
175 Joemre	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
176*:				
Kezar	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Carbol	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.
Rock outcrop.				
177*:				
Kildor	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Rock outcrop.				

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
178*:				
Kiltabar	Severe: flooding, excess salt.	Severe: excess salt.	Severe: excess salt.	Slight.
Tismid	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
179*:				
Lakehelen	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Redfeather	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight.
Amesmont	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
180 Leavitt	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
181*:				
Leavitt	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
Granile	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
182*:				
Leavitt	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Hanson	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
183*:				
Leavitt	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Quander	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
184 Luhon	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
185*:				
Luvar	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, dusty.	Moderate: dusty.
Stylite	Slight	Slight	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
185*:				
Diamonkit	Slight	Slight	Moderate: slope, depth to rock.	Slight.
186*:				
Lymanson loam	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Lymanson cobbly loam	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: large stones, slope.	Moderate: large stones.
187 Manada	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones, wetness.	Slight.
188 McFadden	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
189*:				
Miracle	Slight	Slight	Severe: slope.	Slight.
Cheadle	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
190*:				
Moyerson	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
Kemmerer	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
191*:				
Nathale	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Passcreek, cobbly subsoil	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.				
192 Pahlow	Slight	Slight	Moderate: small stones.	Slight.
193*:				
Pilotpeak	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, slope, depth to rock.	Moderate: large stones, dusty.
Canwall	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
194 Pinelli	Slight	Slight	Moderate: slope.	Slight.
195*. Pits, mine				
196*: Poin	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, small stones.	Severe: large stones, slope.
Bowen	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
Rock outcrop.				
197*: Poposhia	Slight	Slight	Severe: slope.	Slight.
Blazon	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
198*: Poposhia	Slight	Slight	Moderate: slope.	Slight.
Forelle	Slight	Slight	Moderate: slope.	Slight.
199*: Poposhia	Slight	Slight	Severe: slope.	Slight.
Chaperton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
200*: Rainbolt	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
Morset	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight.
201*: Redfeather	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Lakehelen	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
201*:				
Rogert	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
202 Redrob	Severe: flooding, wetness.	Moderate: wetness, excess salt.	Severe: wetness.	Moderate: wetness.
203*:				
Redrob, frequently flooded	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
Grenoble	Severe: flooding.	Moderate: flooding, wetness, small stones.	Severe: small stones, flooding.	Moderate: flooding.
Redrob	Severe: flooding, wetness.	Moderate: wetness, excess salt.	Severe: wetness.	Moderate: wetness.
204*:				
Redrob, frequently flooded	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
Redrob	Severe: flooding, wetness.	Moderate: wetness, excess salt.	Severe: wetness.	Moderate: wetness.
205*:				
Redrob, frequently flooded	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.
Redrob	Severe: flooding, wetness.	Moderate: wetness, excess salt.	Severe: wetness.	Moderate: wetness.
Urban land.				
206*:				
Rentsac	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight.
Wycolo	Slight	Slight	Severe: slope.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
207*:				
Renvers	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, slope, small stones.	Moderate: dusty.
Chalkhill	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
208*:				
Rimton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Passcreek, cobbly subsoil	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Miracle	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
209*. Riverwash				
210*: Rock outcrop.				
Bonjea	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
211*: Rock outcrop.				
Bruja	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope, small stones.	Severe: slope.
Byrnie	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
212*: Rock outcrop.				
Cathedral	Severe: slope, small stones.	Severe: slope, small stones.	Severe: large stones, slope, small stones.	Severe: slope.
213*: Rock outcrop.				
Cathedral	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
213*:				
Alderon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
214*:				
Rock outcrop.				
Pilotpeak	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, slope, depth to rock.	Moderate: large stones.
215*:				
Rock outcrop.				
Rogert	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
216 Rock River	Slight	Slight	Moderate: slope.	Slight.
217 Rock River	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
218*:				
Rock River	Slight	Slight	Moderate: slope.	Slight.
Urban land.				
219*:				
Rogert	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.
Lakehelen	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Rock outcrop.				
220*:				
Rogert	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.
Rock outcrop.				
Amesmont	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
221 Rohonda	Slight	Slight	Moderate: slope, depth to rock.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
222*:				
Rohonda	Slight	Slight	Severe: slope.	Slight.
Tieside	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, small stones, depth to rock.	Slight.
223*:				
Rohonda	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Cheadle	Severe: slope, large stones, depth to rock.	Severe: slope, large stones, depth to rock.	Severe: large stones, slope, small stones.	Severe: large stones, slope.
Rock outcrop.				
224 Ryark	Slight	Slight	Moderate: slope.	Slight.
225*:				
Shirleybasin	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
Twocabin	Moderate: slope, small stones, dusty.	Moderate: slope, small stones, dusty.	Severe: slope, small stones.	Moderate: dusty.
Lahtida	Moderate: dusty.	Moderate: dusty.	Severe: slope.	Moderate: dusty.
226 Silas	Severe: flooding.	Slight	Moderate: slope, small stones.	Slight.
227*:				
Silas, gravelly substratum	Slight	Slight	Moderate: slope, small stones.	Slight.
Vensora	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
228 Stunner	Slight	Slight	Moderate: slope.	Slight.
229*:				
Stunner	Slight	Slight	Moderate: slope.	Slight.
Borollic Camborthids.				

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
230*:				
Stunner	Slight	Slight	Moderate: slope.	Slight.
Tisworth	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
Blazon	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight.
231*:				
Stunner	Slight	Slight	Moderate: slope.	Slight.
Urban land.				
232 Teeler	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.
233*:				
Thiel	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
Lymanson	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Leavitt	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
234*:				
Tieside	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
Pilotpeak	Severe: depth to rock.	Severe: depth to rock.	Severe: large stones, slope, depth to rock.	Slight.
Rock outcrop.				
235 Tismid	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
236*:				
Tisworth	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Moderate: dusty.
Gerdrum Family	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Moderate: dusty.
237*:				
Tisworth	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.
Gerdrum Family	Severe: excess sodium.	Severe: excess sodium.	Severe: excess sodium.	Slight.

See footnote at end of table.

TABLE 10.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
238*:				
Tule	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Moderate: dusty.
Chalkville	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Moderate: dusty.
239*:				
Tyzak	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: large stones, slope, small stones.	Severe: slope.
Rock outcrop.				
240 Wycolo	Slight	Slight	Moderate: slope, small stones, depth to rock.	Slight.
241*:				
Wycolo	Slight	Slight	Severe: slope.	Slight.
Alcova	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight.
242*:				
Wycolo	Slight	Slight	Moderate: slope, small stones, depth to rock.	Slight.
Alcova	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
Urban land.				
243*:				
Wycolo	Slight	Slight	Severe: slope.	Slight.
Tieside	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Slight.
244*:				
Wycolo	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Thermopolis	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.
Rock outcrop.				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
100: Aberone	Slight	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
101*:						
Abston	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: excess sodium, slope.
Bullock	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: excess sodium, slope.
102*:						
Alcova	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.
Borollic Camborthids.						
103*:						
Alcova, shallow substratum	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: droughty.
Lupinto	Slight	Slight	Slight	Moderate: slope.	Slight	Moderate: small stones, droughty.
Dahlquist	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Moderate: frost action, large stones.	Severe: small stones.
104*:						
Alcova, calcareous subsoil	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: droughty.
Rock River	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Severe: small stones.
105: Almy	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Slight.
106*:						
Almy	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Moderate: shrink-swell, frost action.	Slight.
Urban land.						

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
107*:						
Almy	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell.	Moderate: shrink-swell, frost action.	Slight.
Tismid	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Severe: excess sodium.
108 Alogia	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Slight.
109*:						
Alogia	Moderate: wetness.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Slight.
Urban land.						
110 Anchutz	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength, frost action.	Slight.
111*:						
Ansel	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Granile	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
112*:						
Bateson	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Moderate: shrink-swell, slope.	Moderate: small stones, droughty, slope.
Shirleybasin	Moderate: too clayey.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
113*:						
Blackhall	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope, depth to rock.
Browtine, moist	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, droughty, slope.
114*:						
Blackhall	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope.	Severe: depth to rock.
Satanka	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: slope, depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
114*:						
Rock outcrop.						
115*:						
Blazon-----------	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Severe: depth to rock.
Chaperton--------	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, depth to rock.
116*:						
Blazon-----------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope, depth to rock.
Delphill---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
117*:						
Bonjea-----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Chugcreek--------	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, shrink-swell, slope.	Moderate: slope, depth to rock.
Rock outcrop.						
118*:						
Bonjea-----------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
Chugcreek--------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
119--------------- Bosler, wet substratum	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Moderate: wetness, droughty.
120*:						
Bosler-----------	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Moderate: shrink-swell.	Slight.
Borollic Camborthids.						

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
121*:						
Bosler, wet substratum------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Moderate: wetness, droughty.
Urban land.						
122*:						
Boyle------------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
Alderon----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cathedral--------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
123*:						
Boyle------------	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Severe: depth to rock.
Boyle, thin solum	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Severe: depth to rock.
124*:						
Boyle------------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop.						
125*:						
Boyle------------	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, frost action.	Severe: depth to rock.
Lininger---------	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Slight---------	Moderate: depth to rock.
126--------------- Browtine	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: small stones, droughty.
127*:						
Browtine---------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: small stones, droughty.
Hilltoppe--------	Severe: cemented pan.	Moderate: cemented pan.	Severe: cemented pan.	Moderate: slope, cemented pan.	Moderate: cemented pan.	Severe: small stones, droughty, cemented pan.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
128*:						
Bruja	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones, droughty, slope.
Canwall	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Telecan	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
129*:						
Buffork	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Bucklon	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
130*:						
Byrnie	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop.						
131. Calciborolls						
132 Canburn	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
133 Cantle	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness, flooding.
134*:						
Carbol	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
135*:						
Carmody	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Edlin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
136*:						
Carmody	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
136*:						
Ryan Park	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
137*:						
Cathedral	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Spinekop	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength.	Slight.
Rock outcrop.						
138 Center Creek	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength.	Slight.
139*:						
Chaperton, moderately saline	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: slope, depth to rock.
Blazon	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Severe: depth to rock.
140*:						
Chaperton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Poposhia	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
141*:						
Cheadle	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Passcreek, cobbly subsoil	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
142*:						
Cheadle	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
142*:						
Miracle----------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
143. Cryaquolls						
144. Cryoborolls						
145*:						
Cushool----------	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: depth to rock.
Cutback----------	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Slight---------	Moderate: depth to rock.
146*:						
Cushool----------	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Slight---------	Moderate: frost action.	Moderate: depth to rock.
Diamondville-----	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Slight---------	Moderate: frost action.	Moderate: depth to rock.
147*:						
Cutback----------	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, large stones, slope.
Pinelli----------	Moderate: too clayey.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
148*:						
Dahlquist--------	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Moderate: frost action, large stones.	Severe: small stones.
Rawlins----------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
Browtine---------	Moderate: large stones, slope.	Moderate: slope, large stones.	Moderate: slope, shrink-swell, large stones.	Severe: slope.	Moderate: slope, frost action, large stones.	Severe: large stones.
149*:						
Dalecreek--------	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: shrink-swell, flooding.	Slight.
Kovich-----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
150*:						
Delphill----------	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, depth to rock.
Blazon------------	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Severe: depth to rock.
151*:						
Diamondville------	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, depth to rock.
Cushool-----------	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, depth to rock.
152*:						
Diamonkit---------	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope.	Moderate: slope, depth to rock.
Stylite-----------	Slight-----------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
153---------------- Elkol	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: excess salt, droughty.
154*:						
Elkol-------------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: excess salt, droughty.
Gerdrum Family----	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: excess sodium.
155*:						
Elkol-------------	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Moderate: excess salt, droughty.
Gerdrum Family----	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Severe: excess sodium.
156---------------- Evanston	Slight-----------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
157*:						
Evanston----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
157*:						
Bonjea	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
158*:						
Fiveoh	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
Fiveoh, cobbly substratum	Slight	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Ryan Park	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
159*:						
Fiveoh, cobbly substratum	Slight	Slight	Slight	Slight	Slight	Moderate: droughty.
Fiveoh	Slight	Slight	Slight	Slight	Slight	Slight.
Urban land.						
160*:						
Fiveoh, cobbly substratum	Slight	Slight	Slight	Slight	Slight	Moderate: droughty.
Joemre	Slight	Slight	Slight	Slight	Slight	Slight.
161 Folavar	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: small stones, wetness.
162*:						
Folavar	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.
Borollic Camborthids.						
163 Forelle	Slight	Slight	Slight	Slight	Moderate: frost action.	Slight.
164*:						
Forelle	Slight	Slight	Slight	Slight	Moderate: frost action.	Slight.
Urban land.						
165*:						
Forelle	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
Diamondville	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
166*:						
Glendive	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Slight.
Redrob	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Moderate: wetness, flooding.	Moderate: wetness, droughty.
Grenoble	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty, flooding.
167*:						
Grenoble	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty, flooding.
Gerrard	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
168 Greyback	Severe: cutbanks cave.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: frost action, large stones.	Severe: large stones, droughty.
169 Gypla	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Severe: excess salt.
170*:						
Gypla	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Severe: excess salt.
Urban land.						
171*:						
Hanson	Moderate: large stones, slope.	Moderate: shrink-swell, slope, large stones.	Moderate: slope, shrink-swell, large stones.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: small stones, large stones, droughty.
Quander	Moderate: large stones, slope.	Moderate: shrink-swell, slope, large stones.	Moderate: slope, shrink-swell, large stones.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: small stones, large stones, slope.
172*:						
Hapjack	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rogert	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.
Amesmont	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Slight	Moderate: droughty, depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
173*:						
Ipson	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Evanston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
174 Joemre	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
175 Joemre	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
176*:						
Kezar	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Carbol	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
177*:						
Kildor	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Rock outcrop.						
178*:						
Kiltabar	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength.	Severe: excess salt.
Tismid	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, frost action.	Severe: excess sodium.
179*:						
Lakehelen	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, shrink-swell, slope.	Moderate: droughty, slope, depth to rock.
Redfeather	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Amesmont	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, depth to rock.
180 Leavitt	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: small stones, droughty.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
181*:						
Leavitt	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Granile	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
182*:						
Leavitt	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Hanson	Moderate: large stones, slope.	Moderate: shrink-swell, slope, large stones.	Moderate: slope, shrink-swell, large stones.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: small stones, large stones, droughty.
183*:						
Leavitt	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Quander	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
184 Luhon	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
185*:						
Luvar	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Stylite	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Diamonkit	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell.	Moderate: depth to rock.
186*:						
Lymanson loam	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope, depth to rock.
Lymanson cobbly loam	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Severe: large stones.
187 Manada	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
188 McFadden	Slight	Slight	Slight	Slight	Slight	Moderate: small stones.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
189*:						
Miracle----------	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock, frost action.	Moderate: depth to rock.
Cheadle----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
190*:						
Moyerson---------	Severe: depth to rock.	Severe: shrink-swell.	Severe: depth to rock, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Severe: depth to rock.
Kemmerer---------	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope, depth to rock.
191*:						
Nathale----------	Severe: depth to rock, large stones, slope.	Severe: slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: droughty, slope.
Passcreek, cobbly subsoil--	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
192--------------- Pahlow	Severe: cutbanks cave.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Severe: droughty.
193*:						
Pilotpeak--------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Canwall----------	Severe: depth to rock.	Moderate: slope, depth to rock, large stones.	Severe: depth to rock.	Severe: slope.	Moderate: depth to rock, slope, large stones.	Moderate: droughty, slope.
194--------------- Pinelli	Moderate: too clayey.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
195*. Pits, mine						
196*:						
Poin-------------	Severe: depth to rock, large stones, slope.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: large stones, droughty, slope.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
196*:						
Bowen	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
197*:						
Poposhia	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength.	Slight.
Blazon	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Severe: low strength.	Severe: depth to rock.
198*:						
Poposhia	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength.	Slight.
Forelle	Slight	Slight	Slight	Slight	Moderate: frost action.	Slight.
199*:						
Poposhia	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength.	Slight.
Chaperton	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, depth to rock.
200*:						
Rainbolt	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope.	Moderate: small stones, slope, depth to rock.
Morset	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: small stones, droughty.
201*:						
Redfeather	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Lakehelen	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rogert	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
202------------- Redrob	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Moderate: wetness, flooding.	Moderate: excess salt, wetness.
203*:						
Redrob, frequently flooded---------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Grenoble---------	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty, flooding.
Redrob-----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Moderate: wetness, flooding.	Moderate: excess salt, wetness.
204*:						
Redrob, frequently flooded---------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Redrob-----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Moderate: wetness, flooding.	Moderate: excess salt, wetness.
205*:						
Redrob, frequently flooded---------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Redrob-----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Moderate: wetness, flooding.	Moderate: excess salt, wetness.
Urban land.						
206*:						
Rentsac----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: droughty, depth to rock.
Wycolo-----------	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Slight---------	Moderate: depth to rock.
207*:						
Renvers----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Chalkhill--------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
208*:						
Rimton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Passcreek, cobbly subsoil	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Miracle	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
209*. Riverwash						
210*: Rock outcrop.						
Bonjea	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
211*: Rock outcrop.						
Bruja	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones, droughty, slope.
Byrnie	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
212*: Rock outcrop.						
Cathedral	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: small stones, slope.
213*: Rock outcrop.						
Cathedral	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: small stones, slope.
Alderon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
214*: Rock outcrop.						
Pilotpeak	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
215*:						
Rock outcrop.						
Rogert	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.
216, 217 Rock River	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
218*:						
Rock River	Slight	Slight	Slight	Slight	Moderate: frost action.	Slight.
Urban land.						
219*:						
Rogert	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.
Lakehelen	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
220*:						
Rogert	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: droughty, slope, depth to rock.
Rock outcrop.						
Amesmont	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, depth to rock.
221 Rohonda	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: depth to rock.
222*:						
Rohonda	Moderate: depth to rock.	Slight	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: depth to rock.
Tieside	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Severe: depth to rock.
223*:						
Rohonda	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, depth to rock.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
223*:						
Cheadle	Severe: depth to rock, large stones, slope.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: large stones, slope, depth to rock.
Rock outcrop.						
224 Ryark	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
225*:						
Shirleybasin	Moderate: too clayey.	Severe: shrink-swell.	Moderate: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
Twocabin	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, large stones, slope.
Lahtida	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: depth to rock.
226 Silas	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding, frost action.	Slight.
227*:						
Silas, gravelly substratum	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Slight.
Vensora	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, frost action.	Severe: wetness.
228 Stunner	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
229*:						
Stunner	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength.	Slight.
Borollic Camborthids.						
230*:						
Stunner	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength.	Slight.
Tisworth	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength, frost action.	Severe: excess sodium.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
230*:						
Blazon-----------	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: low strength.	Severe: depth to rock.
231*:						
Stunner----------	Slight---------	Slight---------	Slight---------	Slight---------	Slight---------	Slight.
Urban land.						
232--------------- Teeler	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
233*:						
Thiel------------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Severe: droughty.
Lymanson---------	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: droughty, slope, depth to rock.
Leavitt----------	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope.
234*:						
Tieside----------	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Severe: depth to rock.
Pilotpeak--------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.						
235--------------- Tismid	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, frost action.	Severe: excess sodium.
236*:						
Tisworth---------	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength, frost action.	Severe: excess sodium.
Gerdrum Family---	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: excess sodium.
237*:						
Tisworth---------	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, low strength, frost action.	Severe: excess sodium.

See footnote at end of table.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
237*:						
Gerdrum Family---	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Severe: excess sodium.
238*:						
Tule-------------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Chalkville-------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, frost action.	Severe: depth to rock.
239*:						
Tyzak------------	Severe: depth to rock, large stones, slope.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope, depth to rock, large stones.	Severe: depth to rock, slope, large stones.	Severe: slope, depth to rock.
Rock outcrop.						
240-------------- Wycolo	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: depth to rock.
241*:						
Wycolo-----------	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: depth to rock.
Alcova-----------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
242*:						
Wycolo-----------	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: depth to rock.
Alcova-----------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Moderate: small stones.
Urban land.						
243*:						
Wycolo-----------	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: depth to rock.
Tieside----------	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Severe: depth to rock.
244*:						
Wycolo-----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
244*:						
Thermopolis------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop.						

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
100 Aberone	Severe: poor filter.	Severe: seepage, slope.	Moderate: large stones.
101*:			
Abston	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Bullock	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
102*:			
Alcova	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Borollic Camborthids.			
103*:			
Alcova, shallow substratum	Severe: poor filter.	Severe: seepage.	Slight.
Lupinto	Severe: poor filter.	Severe: seepage.	Slight.
Dahlquist	Severe: poor filter.	Severe: seepage.	Moderate: large stones.
104*:			
Alcova, calcareous subsoil	Severe: poor filter.	Severe: seepage.	Slight.
Rock River	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
105 Almy	Moderate: percs slowly.	Severe: seepage.	Slight.
106*:			
Almy	Moderate: percs slowly.	Severe: seepage.	Slight.
Urban land.			
107*:			
Almy	Moderate: percs slowly.	Severe: seepage.	Slight.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
107*:			
Tismid	Severe: percs slowly.	Moderate: slope.	Slight.
108 Alogia	Severe: wetness.	Severe: wetness.	Severe: wetness.
109*:			
Alogia	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.			
110 Anchutz	Moderate: percs slowly.	Severe: seepage.	Slight.
111*:			
Ansel	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.
Granile	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.
112*:			
Bateson	Severe: poor filter.	Severe: seepage, slope.	Moderate: slope, too sandy.
Shirleybasin	Severe: percs slowly.	Moderate: seepage, slope.	Slight.
113*:			
Blackhall	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.
Browtine, moist	Severe: slope.	Severe: seepage, slope.	Severe: slope.
114*:			
Blackhall	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
Satanka	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Rock outcrop.			
115*:			
Blazon	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
115*:			
Chaperton	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
116*:			
Blazon	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Delphill	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
117*:			
Bonjea	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Chugcreek	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
Rock outcrop.			
118*:			
Bonjea	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Rock outcrop.			
Chugcreek	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.
119 Bosler, wet substratum	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.
120*:			
Bosler	Severe: poor filter.	Severe: seepage.	Severe: too sandy.
Borollic Camborthids.			
121*:			
Bosler, wet substratum	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.
Urban land.			

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
122*:			
Boyle	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Alderon	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Cathedral	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
123*:			
Boyle	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Boyle, thin solum	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
124*:			
Boyle	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Rock outcrop.			
125*:			
Boyle	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Lininger	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.
126 Browtine	Slight	Severe: seepage.	Slight.
127*:			
Browtine	Slight	Severe: seepage.	Slight.
Hilltoppe	Severe: cemented pan.	Severe: seepage, cemented pan.	Moderate: cemented pan, large stones.
128*:			
Bruja	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope, large stones.
Canwall	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
128*:			
Telecan	Slight	Severe: seepage.	Severe: seepage.
129*:			
Buffork	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Bucklon	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
130*:			
Byrnie	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Rock outcrop.			
131. Calciborolls			
132 Canburn	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.
133 Cantle	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.
134*:			
Carbol	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Rock outcrop.			
135*:			
Carmody	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.
Edlin	Severe: slope.	Severe: seepage, slope.	Severe: slope.
136*:			
Carmody	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
Ryan Park	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
137*:			
Cathedral----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Spinekop-----------	Severe: percs slowly.	Moderate: seepage, slope.	Slight.
Rock outcrop.			
138----------------- Center Creek	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.
139*:			
Chaperton, moderately saline------------	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Blazon-------------	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
140*:			
Chaperton----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Poposhia-----------	Severe: slope.	Severe: slope.	Severe: slope.
141*:			
Cheadle------------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Passcreek, cobbly subsoil-----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Rock outcrop.			
142*:			
Cheadle------------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Rock outcrop.			

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
142*:			
Miracle	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
143. Cryaquolls			
144. Cryoborolls			
145*:			
Cushool	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.
Cutback	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.
146*:			
Cushool	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.
Diamondville	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
147*:			
Cutback	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
Pinelli	Severe: percs slowly.	Moderate: slope.	Slight.
148*:			
Dahlquist	Severe: poor filter.	Severe: seepage.	Moderate: large stones.
Rawlins	Slight	Severe: seepage.	Slight.
Browtine	Severe: percs slowly.	Severe: seepage, slope, large stones.	Moderate: slope, large stones.
149*:			
Dalecreek	Severe: wetness.	Severe: wetness.	Severe: wetness.
Kovich	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
150*:			
Delphill	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Blazon	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
151*:			
Diamondville	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Cushool	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
152*:			
Diamonkit	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Stylite	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
153 Elkol	Severe: percs slowly.	Moderate: slope.	Slight.
154*:			
Elkol	Severe: percs slowly.	Moderate: slope.	Slight.
Gerdrum Family	Severe: percs slowly.	Moderate: slope.	Slight.
155*:			
Elkol	Severe: percs slowly.	Slight	Slight.
Gerdrum Family	Severe: percs slowly.	Moderate: wetness.	Severe: wetness.
156 Evanston	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
157*:			
Evanston	Severe: slope.	Severe: slope.	Severe: slope.
Bonjea	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
158*:			
Fiveoh	Slight	Severe: seepage.	Slight.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
158*:			
Fiveoh, cobbly substratum	Slight	Severe: seepage.	Slight.
Ryan Park	Slight	Severe: seepage.	Slight.
159*:			
Fiveoh, cobbly substratum	Slight	Severe: seepage.	Slight.
Fiveoh	Slight	Severe: seepage.	Slight.
Urban land.			
160*:			
Fiveoh, cobbly substratum	Slight	Severe: seepage.	Slight.
Joemre	Slight	Severe: seepage.	Slight.
161 Folavar	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.
162*:			
Folavar	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.
Borollic Camborthids.			
163 Forelle	Slight	Severe: seepage.	Slight.
164*:			
Forelle	Slight	Severe: seepage.	Slight.
Urban land.			
165*:			
Forelle	Moderate: percs slowly.	Moderate: seepage.	Slight.
Diamondville	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
166*:			
Glendive	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
166*:			
Redrob	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.
Grenoble	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.
167*:			
Grenoble	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.
Gerrard	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.
168 Greyback	Severe: poor filter.	Severe: seepage, large stones.	Severe: seepage, large stones.
169 Gypla	Severe: wetness.	Severe: wetness.	Severe: wetness, excess salt.
170*:			
Gypla	Severe: wetness.	Severe: wetness.	Severe: wetness, excess salt.
Urban land.			
171*:			
Hanson	Moderate: percs slowly, slope, large stones.	Severe: slope, large stones.	Severe: large stones.
Quander	Moderate: percs slowly, slope, large stones.	Severe: slope.	Severe: large stones.
172*:			
Hapjack	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Rogert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Amesmont	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
173*:			
Ipson	Severe: slope.	Severe: seepage, slope.	Severe: slope.
Evanston	Severe: slope.	Severe: slope.	Severe: slope.
174 Joemre	Slight	Severe: seepage.	Slight.
175 Joemre	Moderate: slope.	Severe: seepage, slope.	Moderate: slope.
176*:			
Kezar	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Carbol	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Rock outcrop.			
177*:			
Kildor	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.
Rock outcrop.			
178*:			
Kiltabar	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, excess salt.
Tismid	Severe: percs slowly.	Slight	Slight.
179*:			
Lakehelen	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.
Redfeather	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
Amesmont	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.
180 Leavitt	Slight	Severe: seepage.	Severe: seepage.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
181*:			
Leavitt	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.
Granile	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.
182*:			
Leavitt	Severe: slope.	Severe: slope.	Severe: slope.
Hanson	Moderate: percs slowly, slope, large stones.	Severe: slope, large stones.	Severe: large stones.
183*:			
Leavitt	Severe: slope.	Severe: slope.	Severe: slope.
Quander	Severe: slope.	Severe: slope.	Severe: slope, large stones.
184 Luhon	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
185*:			
Luvar	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Stylite	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Diamonkit	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
186*:			
Lymanson loam	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Lymanson cobbly loam	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
187 Manada	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.
188 McFadden	Slight	Severe: seepage.	Slight.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
189*:			
Miracle	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.
Cheadle	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.
190*:			
Moyerson	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Kemmerer	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.
191*:			
Nathale	Severe: depth to rock, slope, large stones.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Passcreek, cobbly subsoil	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Rock outcrop.			
192 Pahlow	Severe: poor filter.	Severe: seepage.	Moderate: too sandy, large stones.
193*:			
Pilotpeak	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, large stones.
Canwall	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
194 Pinelli	Severe: percs slowly.	Moderate: slope.	Slight.
195*. Pits, mine			
196*:			
Poin	Severe: depth to rock, slope, large stones.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
196*:			
Bowen	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Rock outcrop.			
197*:			
Poposhia	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Blazon	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
198*:			
Poposhia	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Forelle	Moderate: percs slowly.	Moderate: seepage.	Slight.
199*:			
Poposhia	Moderate: percs slowly.	Severe: slope.	Slight.
Chaperton	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
200*:			
Rainbolt	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Morset	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
201*:			
Redfeather	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.
Lakehelen	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Rogert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
202----------------- Redrob	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.
203*:			
Redrob, frequently flooded-----------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.
Grenoble-----------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.
Redrob-------------	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.
204*:			
Redrob, frequently flooded-----------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.
Redrob-------------	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.
205*:			
Redrob, frequently flooded-----------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.
Redrob-------------	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.
Urban land.			
206*:			
Rentsac------------	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
Wycolo-------------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
207*:			
Renvers	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Chalkhill	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
208*:			
Rimton	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Passcreek, cobbly subsoil	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Miracle	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
209*. Riverwash			
210*: Rock outcrop.			
Bonjea	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
211*: Rock outcrop.			
Bruja	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope, large stones.
Byrnie	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
212*: Rock outcrop.			
Cathedral	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
213*: Rock outcrop.			

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
213*:			
Cathedral	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Alderon	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
214*:			
Rock outcrop.			
Pilotpeak	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, large stones.
215*:			
Rock outcrop.			
Rogert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
216, 217 Rock River	Slight	Severe: seepage.	Slight.
218*:			
Rock River	Slight	Severe: seepage.	Slight.
Urban land.			
219*:			
Rogert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Lakehelen	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Rock outcrop.			
220*:			
Rogert	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.
Rock outcrop.			

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
220*:			
Amesmont	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.
221 Rohonda	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.
222*:			
Rohonda	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.
Tieside	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.
223*:			
Rohonda	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
Cheadle	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, seepage, slope.
Rock outcrop.			
224 Ryark	Severe: poor filter.	Severe: seepage.	Slight.
225*:			
Shirleybasin	Severe: percs slowly.	Moderate: seepage, slope.	Slight.
Twocabin	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.
Lahtida	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.
226 Silas	Severe: wetness.	Severe: wetness.	Severe: wetness.
227*:			
Silas, gravelly substratum	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.
Vensora	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
228----------------- Stunner	Moderate: percs slowly.	Severe: seepage.	Slight.
229*:			
Stunner------------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Borollic Camborthids.			
230*:			
Stunner------------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Tisworth-----------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Blazon-------------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
231*:			
Stunner------------	Moderate: percs slowly.	Severe: seepage.	Slight.
Urban land.			
232----------------- Teeler	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.
233*:			
Thiel--------------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.
Lymanson-----------	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.
Leavitt------------	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.
234*:			
Tieside------------	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.
Pilotpeak----------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Rock outcrop.			
235----------------- Tismid	Severe: percs slowly.	Moderate: slope.	Slight.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
236*, 237*:			
Tisworth-----------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Gerdrum Family-----	Severe: percs slowly.	Moderate: slope.	Slight.
238*:			
Tule---------------	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.
Chalkville---------	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.
239*:			
Tyzak--------------	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.
Rock outcrop.			
240----------------- Wycolo	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
241*:			
Wycolo-------------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Alcova-------------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
242*:			
Wycolo-------------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Alcova-------------	Moderate: percs slowly.	Moderate: seepage, slope.	Slight.
Urban land.			
243*:			
Wycolo-------------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Tieside------------	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock.
244*:			
Wycolo-------------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.

See footnote at end of table.

TABLE 12.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill
244*:			
Thermopolis--------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.
Rock outcrop.			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
100 Aberone	Good	Improbable: small stones.	Probable	Poor: small stones, area reclaim.
101*:				
Abston	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium, slope.
Bullock	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess sodium, slope.
102*:				
Alcova	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Borollic Camborthids.				
103*:				
Alcova, shallow substratum	Good	Probable	Probable	Poor: small stones, area reclaim.
Lupinto	Good	Probable	Probable	Poor: small stones, area reclaim.
Dahlquist	Fair: large stones.	Probable	Probable	Poor: small stones, area reclaim.
104*:				
Alcova, calcareous subsoil	Good	Probable	Probable	Poor: small stones, area reclaim.
Rock River	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
105 Almy	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
106*:				
Almy	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Urban land.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
107*:				
Almy	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Tismid	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, excess sodium.
108 Alogia	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: excess salt.
109*:				
Alogia	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: excess salt.
Urban land.				
110 Anchutz	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
111*:				
Ansel	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Granile	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
112*:				
Bateson	Good	Probable	Probable	Poor: small stones, area reclaim.
Shirleybasin	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
113*:				
Blackhall	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Browtine, moist	Poor: slope.	Improbable: small stones.	Improbable: thin layer.	Poor: small stones, area reclaim, slope.
114*:				
Blackhall	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
Satanka	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
114*:				
Rock outcrop.				
115*:				
Blazon	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
Chaperton	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, slope.
116*:				
Blazon	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Delphill	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
117*:				
Bonjea	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Chugcreek	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Rock outcrop.				
118*:				
Bonjea	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop.				
Chugcreek	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
119 Bosler, wet substratum	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
120*:				
Bosler	Good	Probable	Probable	Poor: small stones, area reclaim.
Borollic Camborthids.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
121*:				
Bosler, wet substratum	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Urban land.				
122*:				
Boyle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Alderon	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Cathedral	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
123*:				
Boyle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Boyle, thin solum	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
124*:				
Boyle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop.				
125*:				
Boyle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Lininger	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
126 Browtine	Good	Improbable: small stones.	Probable	Poor: small stones, area reclaim.
127*:				
Browtine	Good	Improbable: small stones.	Probable	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
127*:				
Hilltoppe	Good	Improbable: small stones.	Probable	Poor: cemented pan, small stones, area reclaim.
128*:				
Bruja	Poor: depth to rock, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, slope.
Canwall	Poor: depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, slope.
Telecan	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
129*:				
Buffork	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Bucklon	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
130*:				
Byrnie	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop.				
131. Calciborolls				
132 Canburn	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
133 Cantle	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
134*:				
Carbol	Poor: depth to rock, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: depth to rock, large stones, slope.
Rock outcrop.				
135*:				
Carmody	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Edlin	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
136*:				
Carmody	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, thin layer, slope.
Ryan Park	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim, slope.
137*:				
Cathedral	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Spinekop	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Rock outcrop.				
138 Center Creek	Fair: wetness.	Probable	Probable	Poor: area reclaim.
139*:				
Chaperton, moderately saline	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones, slope.
Blazon	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
140*:				
Chaperton	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Poposhia	Fair: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
141*:				
Cheadle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Passcreek, cobbly subsoil	Poor: depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, slope.
Rock outcrop.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
142*:				
Cheadle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Rock outcrop.				
Miracle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
143. Cryaquolls				
144. Cryoborolls				
145*:				
Cushool	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, small stones.
Cutback	Poor: depth to rock.	Improbable: small stones.	Improbable: thin layer.	Poor: small stones.
146*:				
Cushool	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, small stones.
Diamondville	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones, thin layer.
147*:				
Cutback	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: small stones.
Pinelli	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
148*:				
Dahlquist	Fair: large stones.	Probable	Probable	Poor: small stones, area reclaim.
Rawlins	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Browtine	Fair: shrink-swell, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
149*:				
Dalecreek	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Kovich	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
150*:				
Delphill	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, slope.
Blazon	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
151*:				
Diamondville	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones, thin layer.
Cushool	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, small stones.
152*:				
Diamonkit	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Stylite	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
153 Elkol	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
154*:				
Elkol	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Gerdrum Family	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, excess sodium.
155*:				
Elkol	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Gerdrum Family	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
156 Evanston	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
157*:				
Evanston	Fair: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Bonjea	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
158*:				
Fiveoh	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Fiveoh, cobbly substratum	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Ryan Park	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
159*:				
Fiveoh, cobbly substratum	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Fiveoh	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Urban land.				
160*:				
Fiveoh, cobbly substratum	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Joemre	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
161 Folavar	Poor: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
162*:				
Folavar	Poor: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Borollic Camborthids.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
163: Forelle	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
164*:				
Forelle	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Urban land.				
165*:				
Forelle	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Diamondville	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones, thin layer.
166*:				
Glendive	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Redrob	Fair: wetness.	Improbable: small stones.	Probable	Poor: small stones, area reclaim.
Grenoble	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
167*:				
Grenoble	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Gerrard	Poor: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
168: Greyback	Fair: large stones.	Probable	Probable	Poor: small stones, area reclaim.
169: Gypla	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
170*:				
Gypla	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
Urban land.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
171*:				
Hanson	Fair: shrink-swell, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones.
Quander	Fair: shrink-swell, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
172*:				
Hapjack	Poor: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: depth to rock, small stones, slope.
Rogert	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
Amesmont	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
173*:				
Ipson	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Evanston	Fair: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
174 Joemre	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
175 Joemre	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
176*:				
Kezar	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Carbol	Poor: depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: depth to rock, large stones, slope.
Rock outcrop.				
177*:				
Kildor	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
178*:				
Kiltabar	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt.
Tismid	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, excess sodium.
179*:				
Lakehelen	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Redfeather	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Amesmont	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: small stones.
180 Leavitt	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
181*:				
Leavitt	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Granile	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
182*:				
Leavitt	Fair: shrink-swell, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Hanson	Fair: shrink-swell, large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones.
183*:				
Leavitt	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Quander	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
184 Luhon	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
185*:				
Luvar	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, excess salt, thin layer.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
185*:				
Stylite	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer.
Diamonkit	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
186*:				
Lymanson loam	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, slope.
Lymanson cobbly loam	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, slope.
187 Manada	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
188 McFadden	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
189*:				
Miracle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey.
Cheadle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
190*:				
Moyerson	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey.
Kemmerer	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
191*:				
Nathale	Poor: depth to rock, large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, slope.
Passcreek, cobbly subsoil	Poor: depth to rock, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, slope.
Rock outcrop.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
192----------------- Pahlow	Fair: large stones.	Probable------------	Probable------------	Poor: small stones, area reclaim.
193*:				
Pilotpeak-----------	Poor: depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: depth to rock, large stones.
Canwall-------------	Poor: depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones.
194----------------- Pinelli	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
195*. Pits, mine				
196*:				
Poin----------------	Poor: depth to rock, large stones, slope.	Improbable: large stones.	Improbable: large stones.	Poor: depth to rock, large stones, slope.
Bowen---------------	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rock outcrop.				
197*:				
Poposhia------------	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Blazon--------------	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
198*:				
Poposhia------------	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Forelle-------------	Good----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
199*:				
Poposhia------------	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Chaperton-----------	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
200*:				
Rainbolt	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Morset	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
201*:				
Redfeather	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Lakehelen	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rogert	Poor: depth to rock, slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
202 Redrob	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
203*:				
Redrob, frequently flooded	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.
Grenoble	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Redrob	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
204*:				
Redrob, frequently flooded	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.
Redrob	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
205*:				
Redrob, frequently flooded	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.
Redrob	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Urban land.				
206*:				
Rentsac	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Wycolo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey, small stones.
207*:				
Renvers	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Chalkhill	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
208*:				
Rimton	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
Passcreek, cobbly subsoil	Poor: depth to rock, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: large stones, slope.
Miracle	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
209*. Riverwash				
210*:				
Rock outcrop.				
Bonjea	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
211*:				
Rock outcrop.				

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
211*:				
Bruja	Poor: depth to rock, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: small stones, slope.
Byrnie	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
212*: Rock outcrop.				
Cathedral	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
213*: Rock outcrop.				
Cathedral	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Alderon	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
214*: Rock outcrop.				
Pilotpeak	Poor: depth to rock.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: depth to rock, large stones.
215*: Rock outcrop.				
Rogert	Poor: depth to rock, slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
216, 217 Rock River	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
218*:				
Rock River	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Urban land.				
219*:				
Rogert	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
219*:				
Lakehelen	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rock outcrop.				
220*:				
Rogert	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: depth to rock, small stones, slope.
Rock outcrop.				
Amesmont	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: small stones.
221 Rohonda	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones.
222*:				
Rohonda	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones.
Tieside	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
223*:				
Rohonda	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones, slope.
Cheadle	Poor: depth to rock, large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: depth to rock, large stones, slope.
Rock outcrop.				
224 Ryark	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
225*:				
Shirleybasin	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Twocabin	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Lahtida	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
226 Silas	Fair: shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
227*:				
Silas, gravelly substratum	Fair: wetness.	Probable	Probable	Poor: area reclaim.
Vensora	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
228 Stunner	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
229*:				
Stunner	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Borollic Camborthids.				
230*:				
Stunner	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Tisworth	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, excess sodium.
Blazon	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
231*:				
Stunner	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
232 Teeler	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
233*:				
Thiel	Good	Probable	Probable	Poor: small stones, area reclaim.
Lymanson	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Leavitt	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
234*:				
Tieside	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
234*:				
Pilotpeak	Poor: depth to rock.	Improbable: small stones.	Improbable: thin layer.	Poor: depth to rock, small stones.
Rock outcrop.				
235 Tismid	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, excess sodium.
236*, 237*:				
Tisworth	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, excess sodium.
Gerdrum Family	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess salt, excess sodium.
238*:				
Tule	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
Chalkville	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones.
239*:				
Tyzak	Poor: depth to rock, large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: depth to rock, large stones, slope.
Rock outcrop.				
240 Wycolo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey.
241*:				
Wycolo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey.
Alcova	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
242*:				
Wycolo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey.
Alcova	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
242*:				
Urban land.				
243*:				
Wycolo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too clayey.
Tieside	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.
244*:				
Wycolo	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Thermopolis	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, slope.
Rock outcrop.				

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation
100: Aberone	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.
101*:					
Abston	Severe: slope.	Severe: excess sodium.	Severe: no water.	Deep to water	Slope, percs slowly.
Bullock	Severe: slope.	Severe: piping, excess sodium.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
102*:					
Alcova	Moderate: seepage, slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing.
Borollic Camborthids.					
103*:					
Alcova, shallow substratum	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.
Lupinto	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.
Dahlquist	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, droughty.
104*:					
Alcova, calcareous subsoil	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
Rock River	Moderate: seepage, slope.	Slight	Severe: no water.	Deep to water	Slope, droughty.
105: Almy	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope.
106*:					
Almy	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable.
Urban land.					
107*:					
Almy	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Soil blowing.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
107*:					
Tismid-----------	Moderate: slope.	Severe: excess sodium.	Severe: no water.	Deep to water----	Slope, excess sodium.
108--------------- Alogia	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water----	Excess salt.
109*:					
Alogia-----------	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water----	Excess salt.
Urban land.					
110--------------- Anchutz	Severe: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water----	Slope, soil blowing.
111*:					
Ansel------------	Severe: seepage, slope.	Slight-----------	Severe: no water.	Deep to water----	Slope, droughty.
Granile----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
112*:					
Bateson----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty.
Shirleybasin-----	Moderate: seepage, slope.	Slight-----------	Severe: no water.	Deep to water----	Slope, percs slowly.
113*:					
Blackhall--------	Severe: depth to rock, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water----	Slope, depth to rock.
Browtine, moist--	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty.
114*:					
Blackhall--------	Severe: depth to rock, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Satanka----------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Rock outcrop.					

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation
115*:					
Blazon	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
Chaperton	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
116*:					
Blazon	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
Delphill	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.
117*:					
Bonjea	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
Chugcreek	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
Rock outcrop.					
118*:					
Bonjea	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
Rock outcrop.					
Chugcreek	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
119 Bosler, wet substratum	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, soil blowing.
120*:					
Bosler	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, soil blowing.
Borollic Camborthids.					
121*:					
Bosler, wet substratum	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, soil blowing.
Urban land.					

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
122*:					
Boyle------------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
Alderon----------	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty.
Cathedral--------	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
123*:					
Boyle------------	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
Boyle, thin solum------	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
124*:					
Boyle------------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
Rock outcrop.					
125*:					
Boyle------------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
Lininger---------	Severe: seepage.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, depth to rock.
126--------------- Browtine	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty.
127*:					
Browtine---------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty.
Hilltoppe--------	Severe: seepage, cemented pan.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, cemented pan.
128*:					
Bruja------------	Severe: seepage, slope.	Severe: large stones.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
Canwall----------	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, large stones, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
128*:					
Telecan----------	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing.
129*:					
Bufforк----------	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Bucklon----------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
130*:					
Byrnie-----------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, soil blowing.
Rock outcrop.					
131. Calciborolls					
132--------------- Canburn	Severe: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding---------	Wetness, flooding.
133--------------- Cantle	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Flooding, frost action.	Wetness, flooding.
134*:					
Carbol-----------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
Rock outcrop.					
135*:					
Carmody----------	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Edlin------------	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing.
136*:					
Carmody----------	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Ryan Park--------	Severe: seepage, slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water----	Slope, soil blowing.
137*:					
Cathedral--------	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
137*:					
Spinekop	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
Rock outcrop.					
138 Center Creek	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness.
139*:					
Chaperton, moderately saline	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock, excess salt.
Blazon	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.
140*:					
Chaperton	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
Poposhia	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope.
141*:					
Cheadle	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Passcreek, cobbly subsoil	Severe: seepage, slope.	Severe: large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Rock outcrop.					
142*:					
Cheadle	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty.
Rock outcrop.					
Miracle	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
143. Cryaquolls					
144. Cryoborolls					

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
145*:					
Cushool----------	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Cutback----------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
146*:					
Cushool----------	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water----	Soil blowing, depth to rock.
Diamondville-----	Moderate: seepage, depth to rock.	Severe: piping.	Severe: no water.	Deep to water----	Soil blowing, depth to rock.
147*:					
Cutback----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
Pinelli----------	Moderate: slope.	Slight-----------	Severe: no water.	Deep to water----	Slope, percs slowly.
148*:					
Dahlquist--------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
Rawlins----------	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing.
Browtine---------	Severe: seepage, slope.	Severe: large stones.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
149*:					
Dalecreek--------	Moderate: seepage, slope.	Moderate: piping, wetness.	Severe: cutbanks cave.	Slope, cutbanks cave.	Slope, wetness, soil blowing.
Kovich-----------	Moderate: seepage.	Severe: wetness.	Severe: cutbanks cave.	Flooding, frost action.	Wetness, flooding.
150*:					
Delphill---------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, depth to rock.
Blazon-----------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, depth to rock, erodes easily.
151*:					
Diamondville-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
151*:					
Cushool	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
152*:					
Diamonkit	Severe: slope, seepage, piping.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
Stylite	Severe: seepage, piping.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, soil blowing, excess salt.
153 Elkol	Moderate: slope.	Slight	Severe: no water.	Deep to water	Slope, droughty, percs slowly.
154*:					
Elkol	Slight	Slight	Severe: no water.	Deep to water	Droughty, percs slowly.
Gerdrum Family	Moderate: slope.	Severe: excess sodium.	Severe: no water.	Deep to water	Slope, droughty.
155*:					
Elkol	Slight	Slight	Severe: no water.	Deep to water	Droughty, percs slowly.
Gerdrum Family	Slight	Severe: excess sodium.	Severe: slow refill.	Deep to water	Percs slowly, excess sodium, excess salt.
156 Evanston	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
157*:					
Evanston	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope.
Bonjea	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
158*:					
Fiveoh	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
Fiveoh, cobbly substratum	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
Ryan Park	Severe: seepage.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope, soil blowing.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
159*:					
Fiveoh, cobbly substratum	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
Fiveoh	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
Urban land.					
160*:					
Fiveoh, cobbly substratum	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Droughty, soil blowing.
Joemre	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
161 Folavar	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.
162*:					
Folavar	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.
Borollic Camborthids.					
163 Forelle	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope.
164*:					
Forelle	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable.
Urban land.					
165*:					
Forelle	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
Diamondville	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
166*:					
Glendive	Severe: seepage.	Severe: piping.	Moderate: deep to water.	Deep to water	Favorable.
Redrob	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, erodes easily.
Grenoble	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
167*:					
Grenoble----------	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.
Gerrard----------	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, flooding.
168---------------- Greyback	Severe: seepage.	Severe: seepage, large stones.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
169---------------- Gypla	Severe: seepage.	Severe: wetness, excess salt.	Severe: salty water.	Frost action, excess salt.	Wetness, droughty, erodes easily.
170*:					
Gypla------------	Severe: seepage.	Severe: wetness, excess salt.	Severe: salty water.	Frost action, excess salt.	Wetness, droughty, erodes easily.
Urban land.					
171*:					
Hanson-----------	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
Quander----------	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
172*:					
Hapjack----------	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
Rogert-----------	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
Amesmont---------	Moderate: seepage, depth to rock, slope.	Moderate: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, soil blowing.
173*:					
Ipson------------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty.
Evanston---------	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water----	Slope, soil blowing.
174---------------- Joemre	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
175--------------- Joemre	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing.
176*:					
Kezar------------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Carbol-----------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
Rock outcrop.					
177*:					
Kildor-----------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, percs slowly, depth to rock.
Rock outcrop.					
178*:					
Kiltabar---------	Slight-----------	Severe: excess salt.	Severe: slow refill, salty water.	Excess salt------	Wetness, droughty, erodes easily.
Tismid-----------	Slight-----------	Severe: excess sodium.	Severe: no water.	Deep to water----	Soil blowing, excess sodium.
179*:					
Lakehelen--------	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, soil blowing.
Redfeather-------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
Amesmont---------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, soil blowing.
180--------------- Leavitt	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty.
181*:					
Leavitt----------	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water----	Slope, percs slowly.
Granile----------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
182*:					
Leavitt----------	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water----	Slope.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
182*:					
Hanson-----------	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
183*:					
Leavitt----------	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water----	Slope.
Quander----------	Severe: slope.	Severe: large stones.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
184--------------- Luhon	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water----	Slope, erodes easily.
185*:					
Luvar------------	Severe: seepage, piping.	Moderate: thin layer, piping, excess salt.	Severe: no water.	Deep to water----	Slope, excess salt.
Stylite----------	Severe: seepage, piping.	Severe: thin layer, piping.	Severe: no water.	Deep to water----	Slope, soil blowing, excess salt.
Diamonkit--------	Severe: seepage, piping.	Severe: thin layer, piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
186*:					
Lymanson loam----	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, depth to rock.
Lymanson cobbly loam------------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, depth to rock.
187--------------- Manada	Severe: seepage.	Moderate: seepage, wetness.	Moderate: deep to water.	Slope------------	Slope, wetness, soil blowing.
188--------------- McFadden	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water----	Slope.
189*:					
Miracle----------	Severe: seepage.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Cheadle----------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty.
190*:					
Moyerson---------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, percs slowly, depth to rock.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
190*:					
Kemmerer	Severe: slope.	Moderate: thin layer, hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly, depth to rock.
191*:					
Nathale	Severe: seepage, slope.	Severe: large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Passcreek, cobbly subsoil	Severe: seepage, slope.	Severe: large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Rock outcrop.					
192 Pahlow	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, droughty.
193*:					
Pilotpeak	Severe: depth to rock, slope.	Severe: large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Canwall	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, large stones, droughty.
194 Pinelli	Moderate: slope.	Slight	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.
195*. Pits, mine					
196*:					
Poin	Severe: depth to rock, slope.	Severe: seepage, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Bowen	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Rock outcrop.					
197*:					
Poposhia	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
Blazon	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
198*:					
Poposhia	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope.
Forelle	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
199*:					
Poposhia	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope.
Chaperton	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
200*:					
Rainbolt	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
Morset	Moderate: seepage, slope.	Slight	Severe: no water.	Deep to water	Slope, droughty.
201*:					
Redfeather	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
Lakehelen	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
Rogert	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.
202 Redrob	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, excess salt.
203*:					
Redrob, frequently flooded	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, flooding, excess salt.
Grenoble	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty.
Redrob	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, soil blowing, excess salt.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
204*:					
Redrob, frequently flooded	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, flooding, excess salt.
Redrob	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, excess salt.
205*:					
Redrob, frequently flooded	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, flooding, excess salt.
Redrob	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, soil blowing, excess salt.
Urban land.					
206*:					
Rentsac	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Wycolo	Moderate: seepage, depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
207*:					
Renvers	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
Chalkhill	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
208*:					
Rimton	Severe: slope.	Moderate: thin layer, large stones.	Severe: no water.	Deep to water	Slope, large stones, soil blowing.
Passcreek, cobbly subsoil	Severe: seepage, slope.	Severe: large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Miracle	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
209*. Riverwash					

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
210*: Rock outcrop.					
Bonjea-----------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
211*: Rock outcrop.					
Bruja------------	Severe: seepage, slope.	Severe: large stones.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
Byrnie-----------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty.
212*: Rock outcrop.					
Cathedral--------	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
213*: Rock outcrop.					
Cathedral--------	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
Alderon----------	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, droughty, soil blowing.
214*: Rock outcrop.					
Pilotpeak--------	Severe: depth to rock, slope.	Severe: large stones.	Severe: no water.	Deep to water----	Slope, large stones, droughty.
215*: Rock outcrop.					
Rogert-----------	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water----	Slope, droughty, depth to rock.
216--------------- Rock River	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing.
217--------------- Rock River	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water----	Slope.
218*: Rock River-------	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water----	Slope, soil blowing.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
218*: Urban land.					
219*: Rogert	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.
Lakehelen	Severe: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
Rock outcrop.					
220*: Rogert	Severe: depth to rock, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.
Rock outcrop.					
Amesmont	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
221 Rohonda	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
222*: Rohonda	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
Tieside	Severe: depth to rock.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty.
223*: Rohonda	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
Cheadle	Severe: depth to rock, slope.	Severe: seepage, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Rock outcrop.					
224 Ryark	Severe: seepage.	Moderate: thin layer.	Severe: no water.	Deep to water	Slope, fast intake, soil blowing.
225*: Shirleybasin	Moderate: seepage, slope.	Slight	Severe: no water.	Deep to water	Slope, percs slowly.
Twocabin	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
225*:					
Lahtida	Moderate: depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly, depth to rock.
226 Silas	Moderate: seepage, slope.	Moderate: piping, wetness.	Moderate: deep to water, slow refill.	Slope	Slope, wetness.
227*:					
Silas, gravelly substratum	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Slope, cutbanks cave.	Slope, wetness.
Vensora	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Frost action	Wetness.
228 Stunner	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
229*:					
Stunner	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
Borollic Camborthids.					
230*:					
Stunner	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
Tisworth	Moderate: seepage.	Severe: excess sodium.	Severe: no water.	Deep to water	Droughty, soil blowing.
Blazon	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
231*:					
Stunner	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.
Urban land.					
232 Teeler	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, droughty.
233*:					
Thiel	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.
Lymanson	Severe: seepage, slope.	Moderate: thin layer.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
Leavitt	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
234*:					
Tieside	Severe: depth to rock.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
Pilotpeak	Severe: depth to rock.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.
Rock outcrop.					
235 Tismid	Slight	Severe: excess sodium.	Severe: no water.	Deep to water	Soil blowing, excess sodium.
236*:					
Tisworth	Moderate: seepage, slope.	Severe: excess sodium.	Severe: no water.	Deep to water	Slope, droughty.
Gerdrum Family	Moderate: slope.	Severe: excess sodium.	Severe: no water.	Deep to water	Slope, droughty.
237*:					
Tisworth	Moderate: seepage, slope.	Severe: excess sodium.	Severe: no water.	Deep to water	Slope, droughty.
Gerdrum Family	Moderate: slope.	Severe: excess sodium.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.
238*:					
Tule	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
Chalkville	Severe: depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.
239*:					
Tyzak	Severe: depth to rock, slope.	Severe: large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.
Rock outcrop.					
240 Wycolo	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
241*:					
Wycolo	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water	Slope, soil blowing, depth to rock.
Alcova	Moderate: seepage, slope.	Slight	Severe: no water.	Deep to water	Slope.

See footnote at end of table.

TABLE 14.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation
242*:					
Wycolo-----------	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Alcova-----------	Moderate: seepage, slope.	Slight-----------	Severe: no water.	Deep to water----	Slope.
Urban land.					
243*:					
Wycolo-----------	Moderate: seepage, depth to rock, slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Tieside----------	Severe: depth to rock.	Severe: piping.	Severe: no water.	Deep to water----	Slope, droughty, soil blowing.
244*:					
Wycolo-----------	Severe: slope.	Moderate: thin layer, piping.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Thermopolis------	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water----	Slope, soil blowing, depth to rock.
Rock outcrop.					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
100----------- Aberone	0-8	Gravelly sandy loam.	SM	A-2, A-1-B	0	0	65-85	55-75	35-55	20-35	<25	NP-5
	8-15	Very gravelly sandy loam.	GM	A-1-B	0	0-15	50-60	40-50	25-35	15-25	<25	NP-5
	15-60	Extremely gravelly coarse sandy loam.	GP-GM	A-1-A	0	0-30	25-35	20-25	13-15	5-10	<20	NP
101*:												
Abston-------	0-2	Loam----------	CL-ML	A-4	0	0	90-100	90-100	65-80	50-60	25-30	5-10
	2-25	Clay, clay loam, silty clay loam.	CL, CH	A-7	0	0	90-100	90-100	85-95	70-85	40-55	15-30
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Bullock------	0-2	Sandy loam----	SM	A-2	0	0	100	100	70-80	25-35	<25	NP-5
	2-16	Sandy clay loam, clay loam, loam.	CL-ML, CL	A-4, A-6	0	0	100	100	85-95	50-60	25-40	5-15
	16-24	Sandy clay loam, loam.	CL-ML, CL	A-4	0	0	100	95-100	85-90	50-60	25-30	5-10
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
102*:												
Alcova-------	0-3	Sandy loam----	SM, SC-SM	A-4	0	0	100	100	65-75	35-45	20-30	NP-10
	3-15	Sandy clay loam, clay loam.	CL, SC	A-6	0	0	90-100	85-100	60-80	35-60	30-40	10-20
	15-37	Sandy clay loam.	SC	A-6, A-4	0	0	90-100	85-100	60-85	35-50	25-35	5-15
	37-60	Very gravelly sandy clay loam, very gravelly loam.	GP-GC, GC	A-2	0	0-15	30-55	25-50	15-40	10-30	30-35	10-15
Borollic Camborthids.												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
103*:												
Alcova, shallow substratum--	0-2	Loam----------	CL-ML	A-4	0	0	90-100	90-100	75-85	55-65	20-30	5-10
	2-16	Sandy clay loam, clay loam.	CL, SC	A-6	0	0	90-100	85-100	60-80	35-60	30-40	10-20
	16-27	Very gravelly sandy clay loam, very gravelly loam.	GP-GC, GC	A-2	0	0-15	30-55	25-50	15-40	10-30	30-35	10-15
	27-60	Very gravelly sandy loam, extremely gravelly sandy loam.	GP-GM, GM, GM-GC	A-2, A-1	0	0-15	25-55	20-50	10-35	5-20	15-30	NP-10
Lupinto------	0-2	Gravelly fine sandy loam.	GM	A-2, A-1-B	0	0	55-65	50-60	40-50	20-30	15-25	NP-5
	2-7	Sandy clay loam, gravelly sandy clay loam.	SC	A-6	0	0	80-95	70-90	60-70	35-50	30-35	10-15
	7-24	Very gravelly loam, very gravelly sandy clay loam.	GC	A-2	0	0	40-50	35-45	30-40	20-35	25-35	10-15
	24-60	Very gravelly sandy loam, extremely gravelly sandy loam.	GM, GP-GM	A-1	0	0-15	25-50	20-50	13-30	10-20	15-25	NP-5
Dahlquist----	0-4	Very gravelly loam.	GM-GC, GC, SC-SM, SC	A-4, A-2-4	0-10	15-25	50-75	45-65	40-60	30-50	25-30	5-10
	4-20	Very gravelly sandy clay loam, extremely gravelly sandy clay loam.	GC	A-2	0-10	15-25	30-60	25-55	20-45	10-30	30-35	10-15
	20-60	Extremely gravelly sandy loam.	GM, GP-GM	A-1	0-10	15-35	25-35	15-30	11-22	5-15	15-25	NP-5

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
104*:												
Alcova, calcareous subsoil-----	0-2	Sandy loam----	SM, SC-SM	A-4	0	0	100	100	65-75	35-45	15-30	NP-10
	2-16	Sandy clay loam, clay loam.	CL, SC	A-6	0	0	90-100	85-100	60-80	35-60	30-40	10-20
	16-28	Clay loam, sandy clay loam.	CL, SC	A-6	0	0	90-100	85-100	60-85	35-60	30-35	10-15
	28-60	Very gravelly sandy loam, extremely gravelly sandy loam.	GP-GM, GM, GM-GC	A-2, A-1	0	0-15	25-55	20-50	10-35	5-20	15-30	NP-10
Rock River---	0-2	Very gravelly sandy loam.	GP-GM, GM	A-1	0	0	35-55	30-50	20-35	10-25	15-25	NP-5
	2-10	Gravelly sandy clay loam.	SC, GC	A-6, A-2-6	0	0	60-80	55-75	45-60	30-45	30-40	10-15
	10-60	Gravelly sandy clay loam.	SC, GC	A-6, A-2-6	0	0	60-80	55-75	45-60	30-40	30-40	10-15
105----------- Almy	0-2	Loam----------	CL-ML	A-4	0	0	100	90-100	70-85	50-70	20-30	5-10
	2-11	Loam, clay loam.	CL-ML, CL	A-4, A-6	0	0	100	90-100	75-90	50-75	25-35	5-15
	11-35	Sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-4, A-6	0	0-5	100	90-100	70-85	45-65	25-35	5-15
	35-60	Sandy loam, very fine sandy loam.	SM, SC-SM	A-2, A-4	0	0-5	100	90-100	50-70	30-50	20-30	NP-10
106*:												
Almy---------	0-2	Loam----------	CL-ML	A-4	0	0	100	90-100	70-85	50-70	20-30	5-10
	2-16	Loam, clay loam.	CL-ML, CL	A-4, A-6	0	0	100	90-100	75-90	50-75	25-35	5-15
	16-29	Sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-4, A-6	0	0-5	100	90-100	70-85	45-65	25-35	5-15
	29-60	Sandy loam, very fine sandy loam.	SM, SC-SM	A-2, A-4	0	0-5	100	90-100	50-70	30-50	20-30	NP-10
Urban land.												
107*:												
Almy---------	0-2	Fine sandy loam.	SM	A-2	0	0	100	90-100	60-75	20-35	15-20	NP-5
	2-14	Loam, clay loam.	CL-ML, CL	A-4, A-6	0	0	100	90-100	75-90	50-75	25-35	5-15
	14-38	Sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-4, A-6	0	0-5	100	90-100	70-85	45-65	25-35	5-15
	38-60	Sandy loam, very fine sandy loam.	SM, SC-SM	A-2, A-4	0	0-5	100	90-100	50-70	30-50	20-30	NP-10

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
107*:												
Tismid-------	0-2	Sandy clay loam.	SC, CL	A-6	0	0	100	100	85-90	45-55	25-30	10-15
	2-7	Sandy clay loam, clay loam.	SC, CL	A-6	0	0	100	100	85-90	45-65	30-40	10-20
	7-14	Sandy clay loam, clay loam.	SC, CL	A-6	0	0	100	100	85-90	45-65	30-40	10-20
	14-60	Sandy clay loam, loam.	SC, CL	A-6	0	0	90-100	85-100	75-90	40-60	30-40	10-20
108----------- Alogia	0-3	Loam----------	ML	A-4	0	0	100	100	75-85	50-70	---	NP
	3-21	Loam, clay loam, silty clay loam.	CL	A-6	0	0	100	100	80-90	75-85	30-40	10-15
	21-41	Loam, silt loam.	ML	A-4	0	0	100	100	75-85	65-75	30-35	5-10
	41-60	Clay loam, loam, silt loam.	CL	A-6	0	0	100	100	80-90	60-80	30-40	10-20
109*:												
Alogia-------	0-3	Loam----------	ML	A-4	0	0	100	100	75-85	50-70	---	NP
	3-21	Loam, clay loam, silty clay loam.	CL	A-6	0	0	100	100	80-90	75-85	30-40	10-15
	21-41	Loam, silt loam.	ML	A-4	0	0	100	100	75-85	65-75	30-35	5-10
	41-60	Clay loam, loam, silt loam.	CL	A-6	0	0	100	100	80-90	60-80	30-40	10-20
Urban land.												
110----------- Anchutz	0-2	Sandy loam----	SM, SC-SM	A-4	0	0	100	100	65-75	35-50	15-25	NP-5
	2-15	Sandy clay loam.	SC, CL	A-6	0	0	100	100	80-90	45-60	30-40	10-20
	15-39	Sandy clay loam, clay loam.	CL	A-6	0	0	100	100	85-90	50-70	30-40	10-20
	39-60	Sandy loam, sandy clay loam.	SM, SC-SM	A-4	0	0	95-100	90-100	65-75	35-50	15-30	NP-10
111*:												
Ansel--------	0-6	Gravelly sandy loam.	SM	A-2, A-1	0	0-10	70-85	60-75	40-55	20-35	---	NP
	6-24	Gravelly sandy clay loam.	SC, GC	A-6	0	0-10	65-85	55-75	50-65	35-50	35-40	15-20
	24-60	Very gravelly sandy loam.	GM-GC	A-2, A-1	0	0-10	40-55	35-50	25-40	10-25	20-30	5-10

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
111*:												
Granile------	0-2	Gravelly sandy loam.	SM	A-2, A-1	0-5	5-15	75-85	65-75	45-55	20-35	15-25	NP-5
	2-15	Very gravelly sandy loam.	GM, GP-GM	A-1	0-5	5-20	45-55	40-50	25-35	10-20	15-25	NP-5
	15-24	Very gravelly sandy clay loam, very gravelly clay loam, very cobbly clay loam.	GC	A-2	0-5	5-30	40-50	30-50	25-40	15-35	35-40	15-20
	24-60	Very gravelly sandy loam, very cobbly sandy loam.	GM	A-1	0-5	5-30	40-50	30-50	20-35	10-25	15-25	NP-5
112*:												
Bateson------	0-2	Gravelly sandy clay loam.	SC	A-2	0	0	60-75	55-65	30-50	20-35	30-35	10-15
	2-21	Gravelly sandy clay loam.	SC	A-2	0	0	60-75	55-65	30-50	20-35	30-35	10-15
	21-29	Very gravelly sandy loam.	GM, GP-GM	A-1	0	0	40-55	25-35	15-35	5-15	<25	NP-5
	29-60	Very gravelly loamy sand.	GP, GP-GM	A-1	0	0	40-55	25-35	10-30	0-10	---	NP
Shirleybasin-	0-2	Loam----------	CL	A-6, A-7	0	0	100	90-100	75-90	50-75	35-45	15-25
	2-8	Sandy clay loam, clay loam.	CL, SC	A-7	0	0	100	90-100	75-90	45-65	40-50	20-30
	8-27	Clay, clay loam.	CH	A-7	0	0	80-100	75-100	70-95	60-80	50-60	30-35
	27-60	Clay loam, loam, sandy clay loam.	CL	A-6, A-7	0	0	95-100	85-100	75-90	50-75	35-50	15-30
113*:												
Blackhall----	0-2	Very gravelly fine sandy loam.	GP-GM, GM	A-1	0	0-5	40-55	30-50	30-45	10-25	15-25	NP-5
	2-18	Sandy loam, fine sandy loam.	SM	A-2	0	0-5	80-100	75-100	60-90	15-25	15-25	NP-5
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
113*:												
Browtine, moist-------	0-3	Very gravelly sandy loam.	GM, GP-GM	A-2, A-1	0	0	35-55	30-50	20-40	10-30	15-25	NP-5
	3-19	Extremely gravelly sandy loam, very gravelly sandy loam.	GM, GP-GM	A-1	0	0-15	25-30	20-25	15-20	5-13	15-25	NP-5
	19-43	Very gravelly coarse sandy loam, extremely cobbly coarse sandy loam.	SC-SM, SM, GM, GM-GC	A-2, A-4, A-1-B	0	10-50	60-90	50-80	30-45	20-40	15-25	NP-5
	43-60	Extremely gravelly sandy clay loam.	GC	A-2-6	0	15-25	25-35	20-30	15-25	10-20	30-35	10-15
114*:												
Blackhall----	0-2	Sandy loam----	SM	A-2	0	0-5	90-100	90-100	65-90	25-35	15-25	NP-5
	2-16	Sandy loam, fine sandy loam.	SM	A-2	0	0-5	80-100	75-100	60-90	15-25	15-25	NP-5
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Satanka------	0-4	Fine sandy loam.	SM	A-4	0	0	95-100	95-100	75-85	35-45	---	NP
	4-9	Sandy clay loam.	SC, CL	A-6	0	0	95-100	95-100	75-90	45-60	30-40	10-15
	9-35	Sandy loam, sandy clay loam.	CL-ML, SC-SM, SC, CL	A-4, A-6	0	0	95-100	95-100	75-90	35-55	25-35	5-15
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
115*:												
Blazon-------	0-5	Loam----------	CL	A-6	0	0	90-100	90-100	70-90	60-75	30-35	10-15
	5-15	Clay loam-----	CL	A-6	0	0	90-100	90-100	75-90	65-80	35-40	15-20
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Chaperton----	0-3	Clay loam-----	CL	A-6	0	0	95-100	90-100	80-90	55-75	35-40	15-20
	3-15	Clay loam-----	CL	A-6	0	0	95-100	90-100	80-90	55-75	35-40	15-20
	15-24	Clay loam-----	CL	A-6	0	0	95-100	90-100	80-90	55-75	35-40	15-20
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
116*:												
Blazon-------	0-5	Loam----------	CL	A-6	0	0	90-100	90-100	70-90	60-75	30-35	10-15
	5-15	Clay loam-----	CL	A-6	0	0	90-100	90-100	75-90	65-80	35-40	15-20
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
116*:												
Delphill-----	0-3	Clay loam-----	CL	A-6	0	0	95-100	95-100	80-90	65-80	30-40	15-20
	3-28	Clay loam, loam.	CL	A-6	0	0	95-100	95-100	80-90	65-80	30-40	10-20
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
117*:												
Bonjea-------	0-4	Sandy loam----	SM, SC-SM	A-2, A-4	0	0	90-100	90-100	60-90	30-40	20-30	NP-10
	4-10	Sandy clay loam, gravelly sandy clay loam.	SC	A-6	0	0	70-90	65-85	50-75	35-50	30-35	10-15
	10-15	Gravelly sandy clay loam, very gravelly sandy clay loam.	SC	A-2	0	0	75-90	35-75	25-45	15-35	30-35	10-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Chugcreek----	0-4	Sandy loam----	SM, SC-SM	A-4	0	0	90-100	75-100	50-75	35-50	15-25	NP-5
	4-19	Sandy loam----	SC-SM, SC	A-4	0	0	90-100	75-100	50-75	35-50	20-25	5-10
	19-29	Sandy clay loam, clay loam.	SC, CL	A-6	0	0	85-100	75-100	65-85	45-70	30-40	10-20
	29-38	Gravelly sandy clay loam, gravelly clay loam.	SC, CL	A-6	0	0	70-85	60-75	55-65	35-55	30-40	10-20
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
118*:												
Bonjea-------	0-4	Sandy loam----	SM, SC-SM	A-2, A-4	0	0	90-100	90-100	60-90	30-40	20-30	NP-10
	4-10	Sandy clay loam, gravelly sandy clay loam.	SC	A-6	0	0	70-90	65-85	50-75	35-50	30-35	10-15
	10-15	Gravelly sandy clay loam, very gravelly sandy clay loam.	SC	A-2	0	0	75-90	35-75	25-45	15-35	30-35	10-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
118*:												
Chugcreek----	0-5	Sandy loam----	SM, SC-SM	A-4	0	0	90-100	75-100	50-75	35-50	15-25	NP-5
	5-34	Sandy clay loam, clay loam.	SC, CL	A-6	0	0	85-100	75-100	65-85	45-70	30-40	10-20
	34-36	Gravelly sandy clay loam, gravelly clay loam.	SC, CL	A-6	0	0	70-85	60-75	55-65	35-55	30-40	10-20
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
119----------- Bosler, wet substratum	0-3	Fine sandy loam.	SM	A-2, A-4	0	0	100	100	85-90	30-45	15-25	NP-5
	3-20	Sandy clay loam.	SC	A-6	0	0	100	100	65-75	35-50	30-35	10-15
	20-60	Very gravelly sand, very gravelly loamy sand.	GP-GM, GP	A-1	0	0	40-55	35-50	20-30	0-10	---	NP
120*:												
Bosler-------	0-7	Fine sandy loam.	SM	A-4	0	0	85-100	85-100	75-85	35-50	<25	NP-5
	7-15	Sandy clay loam.	SC, SC-SM, CL, CL-ML	A-6, A-4	0	0	95-100	95-100	80-90	45-60	25-35	5-15
	15-30	Loam, sandy clay loam.	CL-ML, CL, SC-SM, SC	A-4, A-6	0	0	75-100	75-85	60-75	40-60	25-35	5-15
	30-60	Very gravelly sand, very gravelly loamy sand.	GP, GP-GM	A-1	0	0	25-40	25-40	5-25	0-10	---	NP
Borollic Camborthids.												
121*:												
Bosler, wet substratum--	0-3	Fine sandy loam.	SM	A-2, A-4	0	0	100	100	85-90	30-45	15-25	NP-5
	3-20	Sandy clay loam.	SC	A-6	0	0	100	100	65-75	35-50	30-35	10-15
	20-60	Very gravelly sand, very gravelly loamy sand.	GP-GM, GP	A-1	0	0	40-55	35-50	20-30	0-10	---	NP
Urban land.												
122*:												
Boyle--------	0-2	Gravelly sandy loam.	SM, SC-SM	A-1	0	0-5	85-95	50-70	30-50	15-25	20-25	NP-5
	2-10	Very gravelly sandy clay loam.	SC	A-2	0	0-5	85-95	30-40	20-35	15-25	30-35	10-15
	10	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
122*:												
Alderon------	0-6	Gravelly sandy loam.	SM, SC-SM	A-2, A-1	0	0	75-90	55-75	25-45	15-35	15-30	NP-10
	6-34	Gravelly sandy clay loam.	SC	A-2	0	0	70-80	50-65	30-40	20-35	30-35	10-15
	34-40	Very gravelly coarse sandy loam, very gravelly sandy loam.	GM, SM, GP-GM, SP-SM	A-1	0	0	50-60	35-50	20-35	10-20	15-25	NP-5
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Cathedral----	0-7	Gravelly sandy loam.	SM, SC-SM	A-2-4, A-4	0-10	0-5	70-85	60-75	40-55	25-40	15-25	NP-5
	7-14	Very gravelly coarse sandy loam, very gravelly sandy loam.	GM, GM-GC	A-1	0-10	0-20	45-60	30-50	20-35	10-25	15-25	NP-5
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
123*:												
Boyle--------	0-3	Gravelly sandy loam.	SM, SC-SM	A-1	0	0-5	85-95	50-70	30-50	15-25	20-25	NP-5
	3-13	Very gravelly sandy clay loam.	SC	A-2	0	0-5	85-95	30-40	20-35	15-25	30-35	10-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Boyle, thin solum-------	0-2	Gravelly sandy loam.	SM, SC-SM	A-1	0	0-5	85-95	50-70	30-50	15-25	20-25	NP-5
	2-9	Very gravelly sandy clay loam.	SC	A-2	0	0-5	85-95	30-40	20-35	15-25	30-35	10-15
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
124*:												
Boyle--------	0-3	Gravelly sandy loam.	SM, SC-SM	A-1	0	0-5	85-95	50-70	30-50	15-25	20-25	NP-5
	3-17	Very gravelly sandy clay loam.	SC	A-2	0	0-5	85-95	30-40	20-35	15-25	30-35	10-15
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
125*:												
Boyle--------	0-3	Gravelly sandy loam.	SM, SC-SM	A-1	0	0-5	85-95	50-70	30-50	15-25	20-25	NP-5
	3-6	Gravelly sandy clay loam.	SC	A-2	0	0-5	85-95	50-60	30-50	25-35	30-35	10-15
	6-12	Very gravelly sandy clay loam.	SC	A-2	0	0-5	85-95	30-40	20-35	15-25	30-35	10-15
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Lininger-----	0-7	Loam----------	CL-ML	A-4	0	0	90-100	90-100	70-85	55-65	25-30	5-10
	7-14	Gravelly sandy clay loam.	SC, GC	A-2	0	0	60-80	55-75	35-55	20-35	30-35	10-15
	14-24	Very gravelly sandy clay loam.	GM-GC	A-2, A-1-B	0	0	45-55	40-50	25-35	15-25	25-30	5-10
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
126----------- Browtine	0-3	Very gravelly fine sandy loam.	GM, GP-GM	A-1	0	0	30-50	25-45	20-40	10-25	15-20	NP-5
	3-14	Very gravelly sandy loam, extremely gravelly sandy loam.	GM, GP-GM	A-1	0	0-40	30-45	25-40	20-25	10-17	15-25	NP-5
	14-31	Extremely gravelly loam, extremely gravelly sandy loam.	GP-GM, GM	A-1	0	0-25	30-40	15-25	13-21	5-15	15-25	NP-5
	31-60	Extremely gravelly coarse sandy loam, extremely gravelly sandy loam.	GM, GP-GM	A-1	0	0-10	25-30	20-25	13-16	5-13	15-25	NP-5

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
127*:												
Browtine-----	0-5	Very gravelly sandy loam.	GM, GP-GM	A-1	0	0	30-50	25-45	20-40	10-25	15-20	NP-5
	5-12	Very gravelly sandy loam, extremely gravelly sandy loam.	GM, GP-GM	A-1	0	0-40	30-45	25-40	20-25	10-17	15-25	NP-5
	12-42	Extremely gravelly loam, extremely gravelly sandy loam.	GP-GM, GM	A-1	0	0-25	30-40	15-25	13-21	5-15	15-25	NP-5
	42-60	Extremely gravelly coarse sandy loam, extremely gravelly sandy loam.	GM, GP-GM	A-1	0	0-10	25-30	20-25	13-16	5-13	15-25	NP-5
Hilltoppe----	0-3	Very gravelly sandy loam.	GM, GM-GC	A-1	0	0-5	45-55	40-50	30-35	15-25	<25	NP-5
	3-14	Extremely gravelly sandy loam, very gravelly sandy loam.	GP-GM, GM	A-1	0	5-15	25-50	20-40	15-30	5-20	<25	NP-5
	14-33	Indurated-----	---	---	---	---	---	---	---	---	---	---
	33-60	Extremely gravelly sandy loam.	GP-GM, GM	A-1	0	25-40	25-35	20-30	15-22	5-15	<25	NP-5
128*:												
Bruja--------	0-5	Very cobbly very fine sandy loam.	SM, SC-SM, GM-GC	A-2-4, A-4	0	25-40	55-75	50-70	45-65	30-40	20-25	NP-5
	5-23	Very cobbly very fine sandy loam, extremely cobbly very fine sandy loam.	GM, GM-GC	A-2, A-1-B	0-15	30-60	50-60	40-55	35-50	20-30	20-25	NP-5
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
128*:												
Canwall------	0-3	Gravelly fine sandy loam.	SM	A-2	0	0-5	75-80	70-75	50-70	20-30	15-20	NP-5
	3-12	Gravelly very fine sandy loam, gravelly fine sandy loam.	SM, GM	A-4	0	0-10	65-80	60-75	50-65	35-50	15-25	NP-5
	12-26	Very cobbly very fine sandy loam, very cobbly fine sandy loam.	SM	A-4, A-2-4	0-25	40-60	65-75	55-70	45-60	25-40	15-25	NP-5
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Telecan------	0-16	Fine sandy loam.	SM	A-4	0	0	85-100	85-100	70-85	35-50	0-25	NP-5
	16-60	Very fine sandy loam, fine sandy loam.	SM, ML	A-4	0	0	80-100	75-100	65-75	40-55	0-25	NP-5
129*:												
Buffork------	0-7	Sandy loam----	SM	A-2, A-4	0	0-10	85-95	80-90	60-65	30-45	15-25	NP-5
	7-17	Sandy clay loam.	SC	A-6	0	0-5	90-100	85-95	65-75	40-50	30-35	10-15
	17-26	Coarse sandy loam.	SM	A-2	0	0-5	80-90	75-85	35-45	25-35	---	NP
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Bucklon------	0-6	Sandy loam----	SM, SC-SM	A-4, A-2	0	0	100	85-100	60-80	25-45	<25	NP-10
	6-16	Loam----------	CL, SC	A-6	0	0	85-100	75-100	65-90	45-65	25-35	10-15
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
130*:												
Byrnie-------	0-2	Sandy loam----	SC-SM	A-2, A-4	0	0	80-95	75-90	60-70	30-50	20-25	5-10
	2-12	Gravelly sandy loam, gravelly fine sandy loam.	SM, GM	A-2, A-1, A-4	0	0-10	55-80	50-75	40-60	20-40	15-25	NP-5
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
131. Calciborolls												
132----------- Canburn	0-23	Loam----------	CL	A-6	0	0	100	100	85-95	50-60	25-35	10-15
	23-50	Loam----------	CL	A-6	0	0	95-100	85-100	75-90	50-75	25-35	10-15
	50-60	Coarse sandy loam.	SM, SC-SM	A-4, A-2	0	0	100	85-100	55-75	25-45	<25	NP-10
133----------- Cantle	0-27	Loam----------	CL	A-6	0	0	95-100	90-100	85-90	65-80	30-35	10-15
	27-60	Loam, silty clay loam.	CL	A-6	0	0	95-100	85-100	75-90	65-80	30-40	10-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
134*:												
Carbol-------	0-3	Sandy loam----	SM	A-2-4, A-4	0	0-15	100	85-100	65-75	30-50	15-25	NP-5
	3-10	Sandy clay loam.	SC, CL	A-6	0	0	100	85-100	75-90	40-55	30-35	10-15
	10-14	Very cobbly sandy clay loam, extremely cobbly sandy clay loam.	GC, SC	A-6, A-2-6	0-30	40-75	60-70	55-65	45-55	25-40	30-35	10-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
135*:												
Carmody------	0-1	Fine sandy loam.	SM, ML	A-4	0	0	100	100	80-90	40-55	15-25	NP-5
	1-24	Fine sandy loam, very fine sandy loam.	SM, ML	A-4	0	0	100	100	85-95	40-60	15-25	NP-5
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Edlin--------	0-3	Fine sandy loam.	SM, ML	A-4	0	0	100	100	85-90	45-55	<25	NP-5
	3-23	Fine sandy loam.	SM, ML	A-4	0	0	100	100	85-90	45-55	<25	NP-5
	23-60	Fine sandy loam, sandy loam.	SM	A-4	0	0	95-100	95-100	75-85	35-50	<25	NP-5
136*:												
Carmody------	0-5	Fine sandy loam.	SM, ML	A-4	0	0	100	100	80-90	40-55	15-25	NP-5
	5-29	Fine sandy loam, very fine sandy loam.	SM, ML	A-4	0	0	100	100	85-95	40-60	15-25	NP-5
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Ryan Park----	0-1	Fine sandy loam.	SM	A-4	0	0	100	100	85-90	35-50	<25	NP-5
	1-23	Fine sandy loam.	SM, SC-SM	A-4	0	0	95-100	95-100	80-90	35-50	<25	NP-10
	23-60	Fine sandy loam.	SM	A-4	0	0	100	100	85-90	35-50	<25	NP-5

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
137*:												
Cathedral----	0-7	Gravelly sandy loam.	SM, SC-SM	A-2-4, A-4	0-10	0-5	70-85	60-75	40-55	25-40	15-25	NP-5
	7-16	Very gravelly coarse sandy loam, very gravelly sandy loam.	GM, GM-GC	A-1	0-10	0-20	45-60	30-50	20-35	10-25	15-25	NP-5
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Spinekop-----	0-2	Sandy loam----	SM	A-2	0	0	100	90-100	70-80	25-35	15-25	NP-5
	2-31	Loam, clay loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	0	100	100	90-95	70-85	25-40	5-15
	31-60	Loam, very fine sandy loam.	ML, CL-ML	A-4	0	0	100	100	90-95	60-75	20-30	NP-10
Rock outcrop.												
138----------- Center Creek	0-3	Loam----------	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-90	55-75	25-35	5-15
	3-30	Clay loam-----	CL	A-6	0	0	90-100	90-100	85-95	60-85	35-40	15-20
	30-37	Loam----------	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-90	55-75	25-35	5-15
	37-60	Very gravelly sandy loam, very gravelly loamy sand.	GM, GP-GM	A-1	0	0	40-50	35-45	25-30	10-20	15-25	NP-5
139*:												
Chaperton, moderately saline------	0-4	Loam----------	CL	A-6	0	0-5	95-100	90-100	75-90	50-70	25-30	10-15
	4-16	Loam----------	CL	A-6	0	0	95-100	90-100	75-90	50-70	25-30	10-15
	16-35	Loam----------	CL	A-6	0	0	95-100	90-100	75-90	50-70	25-30	10-15
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Blazon-------	0-2	Clay loam-----	CL	A-6	0	0	90-100	90-100	75-90	60-80	35-40	15-20
	2-16	Clay loam-----	CL	A-6	0	0	90-100	90-100	75-90	65-80	35-40	15-20
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
140*:												
Chaperton----	0-1	Cobbly sandy loam.	SC-SM	A-2, A-4	0-5	15-25	75-85	70-80	50-60	25-40	20-25	5-10
	1-10	Clay loam-----	CL	A-6	0	0	95-100	90-100	80-90	55-75	35-40	15-20
	10-28	Clay loam-----	CL	A-6	0	0	95-100	90-100	80-90	55-75	35-40	15-20
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Poposhia-----	0-1	Very cobbly sandy loam.	GM, SM	A-2, A-1	0-5	25-30	50-70	45-65	35-50	20-35	15-25	NP-5
	1-7	Loam, clay loam.	CL	A-6	0	0	95-100	90-100	80-90	60-80	25-35	10-20
	7-60	Loam, clay loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-90	50-70	25-35	10-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
141*:												
Cheadle------	0-3	Cobbly very fine sandy loam.	SM, SC-SM	A-4	0-5	15-25	90-95	80-90	70-80	40-50	15-25	NP-5
	3-7	Very cobbly very fine sandy loam.	SM, SC-SM, GM, GM-GC	A-4	0-5	30-40	65-85	65-75	60-70	35-45	15-25	NP-5
	7-10	Very channery fine sandy loam, very cobbly sandy loam.	SM, GM	A-2, A-1-B	0-5	15-35	55-75	50-70	40-55	20-35	15-25	NP-5
	10	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Passcreek, cobbly subsoil-----	0-4	Fine sandy loam.	ML, CL-ML, SM, SC-SM	A-4	0-5	0-10	95-100	95-100	85-95	40-55	15-30	NP-10
	4-11	Sandy clay loam.	SC, CL	A-6	0-5	5-10	90-95	90-95	80-95	35-55	30-40	10-20
	11-22	Very cobbly fine sandy loam.	SM, SC-SM	A-2, A-1-B	0-5	50-65	60-80	50-70	40-60	20-35	15-30	NP-10
	22	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
142*:												
Cheadle------	0-4	Sandy loam----	SM, SC-SM	A-4	0	5-20	90-100	85-95	65-75	35-50	15-25	NP-5
	4-10	Very channery fine sandy loam, very cobbly sandy loam.	SM, GM	A-2, A-1-B	0-5	15-35	55-75	50-70	40-55	20-35	15-25	NP-5
	10	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
Miracle------	0-12	Fine sandy loam.	SM	A-2, A-4	0	0	90-100	85-100	65-85	25-45	<25	NP-5
	12-24	Sandy clay loam.	SC-SM	A-2, A-4	0	0	90-100	85-100	75-80	30-50	25-30	5-10
	24-38	Sandy loam----	SM	A-2, A-4	0	0	90-100	85-100	60-80	25-45	<25	NP-5
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
143. Cryaquolls												
144. Cryoborolls												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
145*:												
Cushool------	0-3	Sandy loam----	SM, SC-SM	A-2, A-4	0	0	90-100	85-100	70-85	30-50	20-30	NP-10
	3-16	Sandy clay loam.	SC	A-2, A-6	0	0	90-100	85-100	70-85	30-50	30-40	10-20
	16-32	Gravelly sandy loam.	SM, SC-SM	A-2, A-1-B	0	0	60-80	55-75	40-55	20-35	20-25	NP-5
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Cutback------	0-1	Fine sandy loam.	SC-SM	A-4	0	0	85-100	75-90	60-75	35-50	20-25	5-10
	1-7	Sandy clay loam, loam, clay loam.	CL, SC	A-6	0	0	90-100	85-95	60-80	40-70	30-35	10-15
	7-17	Sandy clay loam, loam, clay loam.	CL, SC	A-6	0	0	90-100	85-95	60-80	40-70	30-40	10-20
	17-31	Extremely gravelly sandy clay loam, very gravelly sandy loam.	GP-GM, GM	A-1	0	0-5	20-40	10-25	5-20	5-15	10-20	NP-5
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
146*:												
Cushool------	0-2	Fine sandy loam.	SM, SC-SM	A-2, A-4	0	0	90-100	85-100	70-85	30-50	20-30	NP-10
	2-16	Sandy clay loam.	SC	A-2, A-6	0	0	90-100	85-100	70-85	30-50	30-40	10-20
	16-32	Sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4	0	0	90-100	85-100	70-85	30-50	20-30	NP-10
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Diamondville-	0-8	Fine sandy loam.	SM, ML	A-4	0	0	100	95-100	75-90	40-55	15-25	NP-5
	8-20	Clay loam, loam.	CL-ML, CL	A-4, A-6	0	0	100	95-100	75-90	60-75	25-40	5-15
	20-38	Loam, fine sandy loam.	SM, ML, SC-SM, CL-ML	A-4	0	0	100	75-100	65-90	35-55	15-30	NP-10
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
147*:												
Cutback------	0-2	Gravelly sandy clay loam.	SC	A-6, A-2-6	0	0-10	70-85	60-75	50-65	30-45	30-35	10-15
	2-10	Sandy clay loam, loam, clay loam.	CL, SC	A-6	0	0-5	90-100	85-95	70-85	40-70	30-40	10-20
	10-20	Extremely gravelly sandy clay loam, very gravelly sandy loam.	GP-GM, GM, GM-GC	A-1, A-2-4	0	0-5	20-40	15-30	10-24	5-15	10-20	NP-10
	20-37	Extremely gravelly loamy sand, very gravelly loamy sand.	GP-GM	A-1	0	0-10	25-40	20-35	15-25	5-10	---	NP
	37	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Pinelli------	0-2	Loam----------	CL	A-6	0	0	100	95-100	75-85	65-75	30-35	10-15
	2-17	Clay, silty clay, clay loam.	CL, CH	A-7	0	0	100	95-100	85-95	70-90	40-55	15-30
	17-60	Clay loam-----	CL	A-6, A-7	0	0	95-100	95-100	75-90	65-80	35-45	15-20
148*:												
Dahlquist----	0-2	Very gravelly sandy loam.	GM, SM	A-2, A-1	0-10	15-25	50-75	45-55	30-50	15-30	20-25	NP-5
	2-15	Very cobbly sandy clay loam.	GC	A-2	10-20	25-40	55-65	50-60	40-50	25-35	30-35	10-15
	15-20	Very gravelly sandy clay loam, extremely gravelly sandy clay loam.	GC	A-2	0-10	15-25	30-60	25-55	20-45	10-30	30-35	10-15
	20-60	Very gravelly sandy loam.	GM, GP-GM	A-1	0-10	15-20	40-50	35-45	25-35	10-20	20-25	NP-5
Rawlins------	0-2	Sandy loam----	SM	A-2, A-4	0	0	95-100	90-100	65-75	30-50	<25	NP-5
	2-9	Sandy clay loam.	SC	A-2, A-6	0	0	95-100	90-100	80-90	30-50	30-40	10-20
	9-18	Very fine sandy loam.	SM, SC-SM, ML, CL-ML	A-4	0	0	95-100	90-100	80-90	40-60	<30	NP-10
	18-60	Fine sandy loam.	SM, SC-SM, ML, CL-ML	A-4	0	0	95-100	90-100	80-90	35-55	<30	NP-10
Browtine-----	0-10	Very cobbly sandy loam.	SM	A-2	0	40-50	80-90	70-80	50-60	25-35	<25	NP-5
	10-32	Very cobbly sandy loam.	SM	A-2	0	40-50	80-90	70-80	50-60	25-35	<25	NP-5
	32-60	Gravelly clay loam.	CL	A-6	0	0-5	75-85	65-75	60-70	50-60	30-35	10-15

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
149*:												
Dalecreek----	0-8	Sandy loam----	SM, SC-SM	A-2, A-4	0	0	95-100	90-100	70-85	30-40	15-25	NP-10
	8-32	Loam, sandy clay loam.	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	75-85	50-65	25-35	5-15
	32-60	Stratified sandy clay loam to loamy coarse sand.	CL	A-6	0	0	90-100	90-100	70-85	50-65	30-40	10-20
Kovich-------	0-8	Loam----------	CL-ML	A-4	0	0	80-100	75-100	65-90	50-70	25-30	5-10
	8-31	Loam, sandy clay loam, clay loam.	SC, CL	A-6	0	0	85-100	75-100	65-85	40-70	25-35	10-20
	31-60	Stratified gravelly sand to gravelly sandy clay loam.	SC	A-6, A-2	0	0	70-85	60-75	40-60	30-50	25-35	10-20
150*:												
Delphill-----	0-1	Loam----------	CL	A-6	0	0	95-100	95-100	85-95	60-70	30-35	10-15
	1-21	Clay loam, loam.	CL	A-6	0	0	95-100	95-100	80-90	65-80	30-40	10-20
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Blazon-------	0-2	Clay loam-----	CL	A-6	0	0	90-100	90-100	75-90	60-80	35-40	15-20
	2-11	Clay loam-----	CL	A-6	0	0	90-100	90-100	75-90	65-80	35-40	15-20
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
151*:												
Diamondville-	0-6	Fine sandy loam.	SM, ML	A-4	0	0	100	95-100	75-90	40-55	15-25	NP-5
	6-18	Clay loam, loam.	CL-ML, CL	A-4, A-6	0	0	100	95-100	75-90	60-75	25-40	5-15
	18-35	Loam, fine sandy loam.	SM, ML, SC-SM, CL-ML	A-4	0	0	100	75-100	65-90	35-55	15-30	NP-10
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Cushool------	0-3	Sandy loam----	SM, SC-SM	A-2, A-4	0	0	90-100	85-100	70-85	30-50	20-30	NP-10
	3-15	Sandy clay loam.	SC	A-2, A-6	0	0	90-100	85-100	70-85	30-50	30-40	10-20
	15-28	Sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4	0	0	90-100	85-100	70-85	30-50	20-30	NP-10
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
152*:												
Diamonkit----	0-1	Sandy loam----	SC-SM	A-2, A-4	0	0	100	90-100	65-80	25-45	25-30	5-10
	1-11	Loam, sandy clay loam.	CL, SC	A-6	0	0	100	90-100	80-90	45-65	25-35	10-15
	11-33	Gypsiferous clay loam, gypsiferous loam.	---	---	---	---	---	---	---	---	---	---
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Stylite------	0-2	Sandy loam----	SM, SC-SM	A-4	0	0	100	100	85-90	35-45	15-25	NP-10
	2-14	Loam, clay loam.	CL	A-6	0	0	100	95-100	85-90	60-75	30-35	10-15
	14-31	Clay loam, loam.	CL	A-6	0	0	100	95-100	85-90	60-75	35-40	15-20
	31-60	Gypsiferous loam.	---	---	0	0	100	95-100	---	---	---	---
153----------- Elkol	0-3	Clay loam-----	CL	A-6, A-7	0	0	95-100	95-100	90-95	70-90	35-45	15-25
	3-34	Clay, silty clay, silty clay loam.	CL	A-7	0	0	95-100	95-100	90-100	70-90	40-50	20-25
	34-60	Silty clay loam, clay loam.	CL	A-6, A-7	0	0	95-100	95-100	90-95	70-90	35-45	15-25
154*:												
Elkol--------	0-2	Silty clay loam.	CL	A-6, A-7	0	0	95-100	95-100	90-95	70-90	35-45	15-25
	2-30	Clay, silty clay, silty clay loam.	CL	A-7	0	0	95-100	95-100	90-100	70-90	40-50	20-25
	30-60	Sandy clay loam.	SC, CL	A-6	0	0	95-100	95-100	85-90	40-55	35-40	15-20
Gerdrum Family------	0-1	Loam----------	CL	A-6	0	0	100	100	85-90	60-70	30-35	10-15
	1-16	Clay loam, clay, silty clay loam.	CL	A-7	0	0	100	100	85-95	80-90	45-50	20-25
	16-60	Clay loam, clay, silty clay loam.	CL	A-7	0	0	100	100	85-95	80-90	40-50	20-25
155*:												
Elkol--------	0-5	Silty clay loam.	CL	A-6, A-7	0	0	95-100	95-100	90-95	70-90	35-45	15-25
	5-60	Clay, silty clay, silty clay loam.	CL	A-7	0	0	95-100	95-100	90-100	70-90	40-50	20-25
Gerdrum Family------	0-2	Loam----------	CL	A-6	0	0	95-100	90-100	80-90	60-75	30-35	10-15
	2-21	Silty clay loam, silty clay.	CL	A-7	0	0	95-100	90-100	85-95	75-90	40-50	20-25
	21-60	Clay loam-----	CL	A-6	0	0	95-100	90-100	70-85	60-75	35-40	15-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
156----------- Evanston	0-4	Fine sandy loam.	SM, SC-SM	A-4	0	0	95-100	95-100	80-90	40-50	15-25	NP-5
	4-14	Loam, sandy clay loam, clay loam.	CL	A-6	0	0	95-100	95-100	85-95	55-75	25-35	10-15
	14-60	Loam, clay loam.	CL	A-6	0	0	85-100	75-100	65-95	50-75	25-35	10-15
157*:												
Evanston-----	0-7	Loam----------	CL, CL-ML	A-4	0	0	95-100	95-100	85-90	65-75	25-35	5-10
	7-20	Loam, sandy clay loam, clay loam.	CL	A-6	0	0	95-100	95-100	85-95	55-75	25-35	10-15
	20-60	Loam, clay loam.	CL	A-6	0	0	85-100	75-100	65-95	50-75	25-35	10-15
Bonjea-------	0-5	Fine sandy loam.	SM, SC-SM	A-2, A-4	0	0	90-100	90-100	60-90	30-40	20-30	NP-10
	5-15	Sandy clay loam, gravelly sandy clay loam.	SC	A-6	0	0	70-90	65-85	50-75	35-50	30-35	10-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
158*:												
Fiveoh-------	0-6	Sandy loam----	SM	A-2, A-4	0	0	75-100	75-100	60-80	30-40	<25	NP-5
	6-16	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	0	75-100	75-100	55-75	25-40	<25	NP-5
	16-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	0	75-100	75-100	60-80	30-40	<25	NP-5
Fiveoh, cobbly substratum--	0-3	Sandy loam----	SM	A-4	0	0	100	100	75-85	35-50	15-25	NP-5
	3-22	Fine sandy loam, sandy loam.	SM, SC-SM, CL-ML	A-4	0	0	90-100	85-100	70-85	35-55	15-30	NP-10
	22-31	Cobbly sandy loam.	SM, SC-SM	A-2, A-4	0	15-30	80-85	75-85	55-65	30-45	15-30	NP-10
	31-60	Very cobbly sandy loam.	GM, SM	A-2	0	45-50	60-70	55-65	40-50	25-35	15-25	NP-5
Ryan Park----	0-3	Fine sandy loam.	SM	A-4	0	0	100	100	85-90	35-50	<25	NP-5
	3-18	Fine sandy loam.	SM, SC-SM	A-4	0	0	95-100	95-100	80-90	35-50	<25	NP-10
	18-60	Gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	0	10-15	80-85	75-80	55-65	30-40	<25	NP-5

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
159*:												
Fiveoh, cobbly substratum--	0-3	Fine sandy loam.	SM	A-4	0	0	100	100	75-85	35-50	15-25	NP-5
	3-18	Fine sandy loam, sandy loam.	SM, SC-SM, CL-ML	A-4	0	0	90-100	85-100	70-85	35-55	15-30	NP-10
	18-41	Fine sandy loam, gravelly fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	70-100	65-85	50-70	30-50	15-30	NP-10
	41-60	Very cobbly sandy loam.	GM, SM	A-2	0	45-50	60-70	55-65	40-50	25-35	15-25	NP-5
Fiveoh-------	0-6	Sandy loam----	SM	A-2, A-4	0	0	75-100	75-100	60-80	30-40	<25	NP-5
	6-16	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	0	75-100	75-100	55-75	25-40	<25	NP-5
	16-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	0	75-100	75-100	60-80	30-40	<25	NP-5
Urban land.												
160*:												
Fiveoh, cobbly substratum--	0-3	Fine sandy loam.	SM	A-4	0	0	100	100	75-85	35-50	15-25	NP-5
	3-18	Fine sandy loam, sandy loam.	SM, SC-SM, CL-ML	A-4	0	0	90-100	85-100	70-85	35-55	15-30	NP-10
	18-41	Fine sandy loam, gravelly fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	70-100	65-85	50-70	30-50	15-30	NP-10
	41-60	Very cobbly sandy loam.	GM, SM	A-2	0	45-50	60-70	55-65	40-50	25-35	15-25	NP-5
Joemre-------	0-4	Fine sandy loam.	ML, SM	A-4	0	0	95-100	90-100	70-90	40-55	---	NP
	4-18	Fine sandy loam, very fine sandy loam, loam.	CL-ML, ML, SM, SC-SM	A-4	0	0	95-100	90-100	70-90	40-65	<30	NP-10
	18-60	Fine sandy loam, very fine sandy loam, loam.	CL-ML, ML, SM, SC-SM	A-4	0	0	90-100	85-100	70-90	40-65	<30	NP-10

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
161----------- Folavar	0-3	Very gravelly sandy loam.	GM	A-1	0	0-5	50-55	45-50	30-35	15-25	20-25	NP-5
	3-11	Very gravelly sandy loam.	GM, GM-GC	A-2, A-1	0	0-5	45-55	40-50	25-35	10-25	20-30	NP-10
	11-60	Very gravelly loamy sand, extremely gravelly loamy sand, extremely gravelly sand.	GP, GP-GM	A-1	0	0-5	25-35	20-30	11-18	0-7	0-0	NP
162*:												
Folavar------	0-5	Very gravelly sandy loam.	GM	A-1	0	0-5	50-55	45-50	30-35	15-25	20-25	NP-5
	5-12	Gravelly sandy loam.	SM, SC-SM	A-2, A-1-B	0	0-5	65-75	55-70	40-50	15-35	20-30	NP-10
	12-60	Very gravelly loamy sand, extremely gravelly loamy sand, extremely gravelly sand.	GP, GP-GM	A-1	0	0-5	25-35	20-30	11-18	0-7	0-0	NP
Borollic Camborthids.												
163----------- Forelle	0-2	Loam----------	CL, CL-ML	A-6, A-4	0	0	95-100	90-100	80-90	50-65	25-35	5-15
	2-22	Loam, clay loam.	CL	A-6	0	0	95-100	90-100	80-90	65-75	30-40	10-20
	22-36	Loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-90	50-75	30-40	10-20
	36-60	Fine sandy loam, sandy loam.	SC-SM, SM	A-2, A-4	0	0	90-100	85-100	70-85	30-50	15-25	NP-10
164*:												
Forelle------	0-5	Loam----------	CL, CL-ML	A-6, A-4	0	0	95-100	90-100	80-90	50-65	25-35	5-15
	5-24	Loam, clay loam.	CL	A-6	0	0	95-100	90-100	80-90	65-75	30-40	10-20
	24-35	Loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-90	50-75	30-40	10-20
	35-60	Fine sandy loam, sandy loam.	SC-SM, SM	A-2, A-4	0	0	90-100	85-100	70-85	30-50	15-25	NP-10
Urban land.												
165*:												
Forelle------	0-4	Fine sandy loam.	SC-SM, SM	A-4	0	0	95-100	90-100	70-80	35-50	15-25	NP-10
	4-15	Loam, clay loam.	CL	A-6	0	0	95-100	90-100	80-90	65-75	30-40	10-20
	15-60	Loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-90	50-75	30-40	10-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
165*:												
Diamondville-	0-1	Fine sandy loam.	SM, ML	A-4	0	0	100	95-100	75-90	40-55	15-25	NP-5
	1-17	Clay loam, loam.	CL-ML, CL	A-4, A-6	0	0	100	95-100	75-90	60-75	25-40	5-15
	17-34	Loam, fine sandy loam.	SM, ML, SC-SM, CL-ML	A-4	0	0	100	75-100	65-90	35-55	15-30	NP-10
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
166*:												
Glendive-----	0-6	Loam----------	CL, CL-ML	A-4	0	0	100	100	85-95	60-75	20-25	5-10
	6-60	Stratified sandy loam to loam.	ML, CL-ML, SM, SC-SM	A-4	0	0	100	100	75-85	45-65	15-25	NP-10
Redrob-------	0-9	Loam----------	CL	A-6	0	0	100	100	85-95	60-80	30-35	10-15
	9-19	Stratified loam to sandy loam.	ML, CL-ML	A-4	0	0	100	100	80-90	50-70	15-30	NP-10
	19-24	Very gravelly loam.	GC	A-2	0	0	40-55	35-50	30-40	20-35	30-35	10-15
	24-60	Extremely gravelly loamy sand.	GP, GP-GM	A-1	0	0	20-30	15-25	7-12	3-6	---	NP
Grenoble-----	0-9	Gravelly sandy loam.	SM	A-1, A-2	0	0	85-90	50-70	35-50	20-35	15-25	NP-5
	9-60	Very gravelly loamy sand, very gravelly sand.	SP-SM, GP, SM, GP-GM	A-1	0	0	50-65	35-50	25-35	0-20	---	NP
167*:												
Grenoble-----	0-9	Gravelly loamy sand.	SM	A-1	0	0	85-90	50-70	30-50	15-25	15-25	NP
	9-60	Very gravelly loamy sand, very gravelly sand.	SP-SM, SM, GP, GP-GM	A-1	0	0	50-65	35-50	25-35	0-20	---	NP
Gerrard------	0-12	Loam----------	CL-ML	A-4	0	0	95-100	95-100	70-85	50-70	25-30	5-10
	12-24	Very gravelly loamy sand.	GP-GM, GM	A-1	0	0-15	30-55	25-50	15-35	5-15	---	NP
	24-60	Very gravelly sand.	GP, GP-GM	A-1	0	0-20	25-55	20-50	5-20	2-10	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
168----------- Greyback	0-9	Very cobbly sandy loam.	GM	A-1, A-2-4	0-10	30-45	60-85	50-75	35-50	15-30	15-25	NP-5
	9-16	Very cobbly sandy loam, very gravelly sandy loam.	GM	A-1	0-20	30-50	45-60	35-55	20-40	10-25	15-25	NP-5
	16-30	Very gravelly coarse sandy loam, very cobbly coarse sandy loam.	GM, GP-GM	A-1	0-5	25-55	45-60	35-60	15-30	10-20	---	NP
	30-60	Very gravelly loamy coarse sand, very cobbly coarse sandy loam, very gravelly coarse sandy loam.	GM, GP-GM	A-1	0-5	10-35	45-60	35-50	15-30	5-20	---	NP
169----------- Gypla	0-5	Loam----------	CL-ML	A-4	0	0	95-100	90-100	85-100	75-85	25-30	5-10
	5-36	Gypsiferous silt loam.	---	---	---	---	---	---	---	---	---	---
	36-60	Gypsiferous gravelly silt loam.	---	---	---	---	---	---	---	---	---	---
170*:												
Gypla--------	0-5	Loam----------	CL-ML	A-4	0	0	95-100	90-100	85-100	75-85	25-30	5-10
	5-36	Gypsiferous silt loam.	---	---	---	---	---	---	---	---	---	---
	36-60	Gypsiferous gravelly silt loam.	---	---	---	---	---	---	---	---	---	---
Urban land.												
171*:												
Hanson-------	0-8	Gravelly sandy loam.	SM, SC-SM	A-2	0-5	0-15	75-85	65-75	45-55	25-35	15-25	NP-10
	8-25	Very cobbly loam, very gravelly loam, very cobbly clay loam.	GC	A-2, A-6	0-15	25-55	50-65	45-60	40-55	30-45	30-40	10-20
	25-60	Very cobbly clay loam.	GC	A-7	0-10	30-55	60-70	50-60	45-55	35-50	40-45	15-20
Quander------	0-12	Gravelly loam	SC	A-6	0-5	10-15	75-80	65-75	50-65	35-50	30-35	10-15
	12-26	Very cobbly clay loam.	SC, CL	A-6	0-5	40-55	70-85	60-80	50-65	40-55	35-40	15-20
	26-60	Very cobbly clay loam, very cobbly sandy clay loam.	SC, GC	A-6	0-5	30-60	65-75	60-70	50-60	35-50	35-40	15-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
172*:												
Hapjack------	0-3	Gravelly sandy loam.	SM	A-2	0	0	90-100	50-75	40-60	25-35	---	NP
	3-10	Gravelly sandy clay loam, gravelly sandy loam.	SC-SM, SC	A-4, A-2	0	0	90-100	50-75	35-50	25-45	25-30	5-10
	10-19	Extremely gravelly sandy loam, extremely gravelly loamy sand.	SP-SM	A-1	0	0	90-100	15-25	8-20	5-10	---	NP
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rogert-------	0-8	Gravelly sandy loam.	SM, SC-SM, GM, GM-GC	A-1, A-2	0	0-5	60-80	50-75	40-60	20-35	<25	NP-10
	8-16	Very gravelly sandy loam.	GP-GM, GM, GM-GC	A-1, A-2	0	0-5	35-55	25-40	15-25	10-15	<25	NP-10
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Amesmont-----	0-5	Fine sandy loam.	SM	A-2-4	0	0	100	90-100	60-80	25-35	20-25	NP-5
	5-14	Sandy clay loam.	SC	A-6	0	0	100	75-85	55-70	40-50	30-40	10-20
	14-20	Gravelly sandy clay loam.	SC	A-6, A-2-6	0	0	100	55-75	45-60	25-45	30-40	10-15
	20-33	Very gravelly sandy clay loam.	SC	A-2-6	0	0	100	25-50	20-30	10-25	30-40	10-15
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
173*:												
Ipson--------	0-8	Gravelly sandy loam.	SM, SC-SM	A-2, A-4	0	0	70-85	60-75	40-55	25-40	<25	NP-10
	8-14	Very gravelly sandy clay loam.	GC	A-2	0	0	35-55	30-50	25-45	15-30	30-35	10-15
	14-60	Very gravelly coarse sandy loam.	GM	A-1	0	0	40-60	30-50	20-30	15-20	<25	NP-5
Evanston-----	0-3	Fine sandy loam.	SM, SC-SM	A-4	0	0	95-100	95-100	80-90	40-50	15-25	NP-5
	3-17	Loam, sandy clay loam, clay loam.	CL	A-6	0	0	95-100	95-100	85-95	55-75	25-35	10-15
	17-60	Loam, clay loam.	CL	A-6	0	0	85-100	75-100	65-95	50-75	25-35	10-15

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
174----------- Joemre	0-2	Fine sandy loam.	ML, SM	A-4	0	0	95-100	90-100	70-90	40-55	---	NP
	2-13	Fine sandy loam, very fine sandy loam, loam.	CL-ML, ML, SM, SC-SM	A-4	0	0	95-100	90-100	70-90	40-65	<30	NP-10
	13-60	Fine sandy loam, very fine sandy loam, loam.	CL-ML, ML, SM, SC-SM	A-4	0	0	90-100	85-100	70-90	40-65	<30	NP-10
175----------- Joemre	0-2	Fine sandy loam.	ML, SM	A-4	0	0	95-100	90-100	70-90	40-55	---	NP
	2-16	Fine sandy loam, very fine sandy loam, loam.	CL-ML, ML, SM, SC-SM	A-4	0	0	95-100	90-100	70-90	40-65	<30	NP-10
	16-60	Fine sandy loam, very fine sandy loam, loam.	CL-ML, ML, SM, SC-SM	A-4	0	0	90-100	85-100	70-90	40-65	<30	NP-10
176*: Kezar--------	0-10	Sandy loam----	SM	A-4, A-2	0	0	100	100	70-80	30-50	<25	NP-5
	10-20	Sandy clay loam.	SC, CL	A-6	0	0-10	90-100	85-100	75-90	40-55	30-40	10-15
	20-31	Very cobbly sandy clay loam.	SC, GC	A-6, A-2	0	30-35	60-75	55-70	50-65	30-40	30-40	10-15
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Carbol-------	0-4	Sandy loam----	SM	A-2-4, A-4	0	0-15	100	85-100	65-75	30-50	15-25	NP-5
	4-13	Cobbly sandy clay loam.	SC	A-6	0	15-30	85-95	75-90	65-75	35-50	30-35	10-15
	13-19	Very cobbly sandy clay loam, extremely cobbly sandy clay loam.	GC, SC	A-6, A-2-6	0-30	40-75	60-70	55-65	45-55	25-40	30-35	10-15
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
177*: Kildor-------	0-10	Gravelly loam	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0-5	75-85	65-80	60-65	40-55	25-35	5-15
	10-22	Clay loam, clay.	CH	A-7	0	0	100	95-100	85-95	65-85	50-60	30-40
	22-38	Clay, clay loam.	CH	A-7	0	0	100	95-100	85-95	65-85	50-60	30-40
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
178*: Kiltabar-----	0-1	Silty clay loam.	CL	A-6	0	0	95-100	90-100	85-95	75-90	35-40	15-20
	1-40	Clay loam, silty clay loam, loam.	---	---	0	0	90-100	85-100	75-95	60-85	---	---
	40-60	Clay loam, silty clay loam.	CL	A-6	0	0	90-100	85-100	75-95	65-85	30-40	10-20
Tismid-------	0-4	Sandy loam----	SM, SC-SM	A-4	0	0	100	100	75-80	35-50	<25	NP-10
	4-7	Sandy clay loam, clay loam.	SC, CL	A-6	0	0	100	100	85-90	45-65	30-40	10-20
	7-20	Sandy clay loam, clay loam.	SC, CL	A-6	0	0	100	100	85-90	45-65	30-40	10-20
	20-60	Sandy clay loam, loam.	SC, CL	A-6	0	0	90-100	85-100	75-90	40-60	30-35	10-15
179*: Lakehelen----	0-17	Fine sandy loam.	SM	A-4	0	0	90-100	85-100	70-80	35-50	<25	NP-5
	17-26	Very gravelly sandy clay loam.	GC	A-2	0	0	45-55	40-50	30-40	20-35	30-40	10-20
	26-38	Extremely gravelly sandy loam.	GP-GM, GM	A-1	0	0	25-30	20-25	14-17	5-15	<20	NP-5
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Redfeather---	0-14	Gravelly sandy loam.	SM	A-2, A-1-B	0	0	75-85	65-75	45-55	20-35	15-25	NP-5
	14-19	Very gravelly sandy clay loam.	GC, GP-GC	A-2	0	0	45-55	25-45	15-30	10-25	30-35	10-15
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Amesmont-----	0-5	Fine sandy loam.	SM	A-2	0	0	100	90-100	60-80	25-35	20-25	NP-5
	5-13	Gravelly sandy clay loam.	SC	A-6	0	0	80-90	50-75	40-60	35-45	30-40	10-15
	13-21	Very gravelly loamy sand, very gravelly sandy loam.	SP-SM, SM, GP-GM, GM	A-1	0	0	50-75	25-50	20-30	5-20	0-0	NP
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
180----------- Leavitt	0-6	Gravelly fine sandy loam.	SM, SC-SM	A-2, A-4	0	0	75-85	65-75	55-65	30-40	20-25	NP-5
	6-15	Gravelly loam	SC, CL	A-6	0	0	75-85	65-75	60-65	40-60	30-35	10-15
	15-22	Very gravelly clay loam.	GC	A-2-7, A-7	0	0	45-55	40-50	35-45	30-45	40-45	15-20
	22-60	Very gravelly coarse sandy loam.	GM	A-1	0	0	40-50	35-45	20-30	10-20	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
181*:												
Leavitt	0-4	Gravelly loam	SM	A-4	0	0	70-80	65-75	55-65	40-50	15-25	NP-5
	4-17	Gravelly clay loam.	CL	A-6, A-7	0	0	70-80	65-75	55-65	50-60	35-45	15-20
	17-26	Very gravelly clay loam.	GC	A-2-7, A-7	0	0	45-55	40-50	35-45	30-40	40-45	15-20
	26-60	Clay	CH	A-7	0	0	100	100	85-95	70-80	55-65	30-40
Granile	0-4	Gravelly sandy loam.	SM	A-2, A-1	0-5	5-15	75-85	65-75	45-55	20-35	15-25	NP-5
	4-60	Very gravelly sandy clay loam, very gravelly clay loam, very cobbly clay loam.	GC	A-2	0-5	5-30	40-50	30-50	25-40	15-35	35-40	15-20
182*:												
Leavitt	0-10	Loam	CL, CL-ML	A-4	0	0	100	95-100	85-95	55-70	25-30	5-10
	10-26	Clay loam, sandy clay loam.	CL	A-6	0	0	100	95-100	85-95	50-75	30-35	10-15
	26-60	Sandy clay loam, loam, clay loam.	CL, SC	A-6	0	0	95-100	95-100	80-90	45-65	30-35	10-15
Hanson	0-8	Gravelly sandy loam.	SM, SC-SM	A-2	0-5	0-15	75-85	65-75	45-55	25-35	15-25	NP-10
	8-60	Very cobbly loam, very gravelly loam, very cobbly clay loam.	GC	A-2, A-6	0-15	25-55	50-65	45-60	40-55	30-45	30-40	10-20
183*:												
Leavitt	0-5	Loam	CL, CL-ML	A-4	0	0	100	95-100	85-95	55-70	25-30	5-10
	5-20	Clay loam, sandy clay loam.	CL	A-6	0	0	100	95-100	85-95	50-75	30-35	10-15
	20-60	Sandy clay loam, loam, clay loam.	CL, SC	A-6	0	0	95-100	95-100	80-90	45-65	30-35	10-15
Quander	0-10	Gravelly loam	SC	A-6	0-5	10-15	75-80	65-75	50-65	35-50	30-35	10-15
	10-30	Very cobbly clay loam.	SC, CL	A-6	0-5	40-55	70-85	60-80	50-65	40-55	35-40	15-20
	30-45	Very gravelly clay loam.	GC	A-6, A-2	0-5	10-20	55-60	50-55	40-50	30-40	35-40	15-20
	45-60	Very cobbly clay loam, very cobbly sandy clay loam.	SC, GC	A-6	0-5	30-60	65-75	60-70	50-60	35-50	35-40	15-20
184 Luhon	0-8	Loam	CL-ML, CL	A-6, A-4	0	0	100	100	85-90	60-80	25-35	5-15
	8-60	Silt loam, clay loam.	CL	A-6	0	0	100	100	95-100	75-85	30-35	10-15

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
185*:												
Luvar	0-2	Loam	CL-ML	A-4	0	0	85-100	80-100	70-85	50-65	25-30	5-10
	2-12	Loam, clay loam.	CL	A-6	0	0	100	100	85-90	60-75	30-40	10-20
	12-32	Clay loam, loam.	CL	A-6	0	0	100	100	85-90	60-75	30-40	10-20
	32-60	Gypsiferous loam, gypsiferous clay loam.	---	---	0	0	95-100	85-100	---	---	---	---
Stylite	0-2	Fine sandy loam.	SM, SC-SM	A-4	0	0	100	100	80-90	40-50	15-25	NP-10
	2-14	Loam, clay loam.	CL	A-6	0	0	100	95-100	85-90	60-75	30-35	10-15
	14-30	Clay loam, loam.	CL	A-6	0	0	100	95-100	85-90	60-75	35-40	15-20
	30-60	Gypsiferous loam, gypsiferous clay loam.	---	---	0	0	100	95-100	---	---	---	---
Diamonkit	0-1	Sandy loam	SC-SM	A-2, A-4	0	0	100	90-100	65-80	25-45	25-30	5-10
	1-22	Loam, sandy clay loam.	CL, SC	A-6	0	0	100	90-100	80-90	45-65	25-35	10-15
	22-35	Gypsiferous clay loam.	---	---	---	---	---	---	---	---	---	---
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
186*:												
Lymanson loam	0-7	Loam	CL	A-6	0	0-5	100	90-100	80-90	50-70	25-35	10-15
	7-16	Clay loam	CL	A-6, A-7	0	0	100	90-100	75-90	65-75	35-45	15-20
	16-35	Clay loam, loam.	CL	A-6	0	0	100	90-100	80-90	60-75	30-35	10-15
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Lymanson cobbly loam	0-7	Cobbly loam	CL, SC-SM, SC, CL-ML	A-4, A-6	0	20-35	90-100	85-95	75-85	45-65	25-35	5-15
	7-17	Clay loam	CL	A-6, A-7	0	0	100	90-100	75-90	65-75	35-45	15-20
	17-31	Clay loam, loam.	CL	A-6	0	0	100	90-100	80-90	60-75	30-35	10-15
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
187 Manada	0-2	Sandy loam	SM	A-2, A-4	0	0	100	85-90	65-70	25-40	15-25	NP-5
	2-9	Loam, sandy loam.	SM, SC-SM, ML, CL-ML	A-4	0	0	100	85-90	70-80	40-55	20-30	NP-10
	9-27	Gravelly sandy loam, sandy loam.	SM	A-2, A-4	0	0	80-95	70-85	55-65	25-50	15-25	NP-5
	27-35	Gravelly loam, gravelly sandy loam.	SM, SC-SM	A-4	0	0	80-95	65-75	55-65	35-50	15-30	NP-10
	35-60	Gravelly sandy loam.	SM	A-2, A-4	0	0	80-95	65-75	50-60	25-40	15-25	NP-5

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
188----------- McFadden	0-5	Gravelly fine sandy loam.	SM	A-2, A-4	0	0	70-80	65-75	50-65	25-40	15-25	NP-5
	5-18	Gravelly fine sandy loam, gravelly loam.	SM	A-2, A-1	0	0	55-70	50-65	35-55	20-35	15-25	NP-5
	18-60	Loam, gravelly sandy loam.	SM, ML	A-4, A-2-4	0	0	55-90	50-85	40-70	25-55	15-25	NP-5
189*: Miracle------	0-4	Fine sandy loam.	SM	A-2, A-4	0	0	90-100	85-100	65-85	25-45	<25	NP-5
	4-28	Sandy clay loam.	SC-SM	A-2, A-4	0	0	90-100	85-100	75-80	30-50	25-30	5-10
	28-33	Sandy loam----	SM	A-2, A-4	0	0	90-100	85-100	60-80	25-45	<25	NP-5
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Cheadle------	0-4	Fine sandy loam.	SM, SC-SM	A-4	0	5-20	90-100	85-95	65-75	35-50	15-25	NP-5
	4-9	Channery fine sandy loam.	SM, SC-SM	A-2	0	0-5	75-85	65-75	55-65	25-35	15-25	NP-5
	9-16	Very channery fine sandy loam, very cobbly sandy loam.	SM, GM	A-2, A-1-B	0-5	15-35	55-75	50-70	40-55	20-35	15-25	NP-5
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
190*: Moyerson-----	0-4	Silty clay loam.	CL, CH	A-7	0	0-5	95-100	95-100	85-95	80-90	45-55	20-30
	4-17	Silty clay, clay loam.	CL, CH	A-7	0	0	95-100	95-100	85-95	80-90	45-60	20-35
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Kemmerer-----	0-2	Clay loam-----	CL	A-7	0	0	95-100	90-100	85-95	60-75	45-50	25-30
	2-15	Clay loam, silty clay loam, silty clay.	CH	A-7	0	0	100	100	90-95	75-95	50-55	30-35
	15-34	Silty clay loam, silty clay, clay loam.	CH	A-7	0	0	95-100	90-100	85-100	75-95	50-60	30-35
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
191*:												
Nathale------	0-4	Gravelly fine sandy loam.	GM, SM	A-2, A-1	0	0-5	50-75	50-75	40-60	20-30	---	NP
	4-11	Very cobbly very fine sandy loam, very cobbly loam, very cobbly sandy clay loam.	SC-SM, SC	A-4, A-2-4	0-5	40-60	60-80	55-75	40-60	30-50	25-30	5-10
	11-24	Very cobbly very fine sandy loam, very cobbly fine sandy loam.	SM	A-4, A-2-4, A-1	0-10	40-65	60-80	50-75	40-55	20-40	<30	NP-5
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Passcreek, cobbly subsoil-----	0-7	Very fine sandy loam.	ML, CL-ML, SM, SC-SM	A-4	0-5	0-5	95-100	95-100	85-95	45-60	15-30	NP-10
	7-16	Sandy clay loam.	SC, CL	A-6	0-5	5-10	90-95	90-95	80-95	35-55	30-40	10-20
	16-31	Very cobbly fine sandy loam.	SM, SC-SM	A-2, A-1-B	0-5	50-65	60-80	50-70	40-60	20-35	15-30	NP-10
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
192----------- Pahlow	0-3	Gravelly sandy loam.	SM	A-2, A-4	0	0-10	80-90	75-85	55-65	30-45	15-25	NP-5
	3-15	Very gravelly sandy loam.	SM, GM	A-1	0	10-20	50-65	45-55	35-45	15-25	15-25	NP-5
	15-60	Extremely gravelly loamy sand, very gravelly loamy sand.	SM, SP, SP-SM	A-1	0	10-35	60-80	25-35	20-25	0-15	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
193*:												
Pilotpeak----	0-4	Cobbly very fine sandy loam.	SM, ML	A-4	0-5	15-30	80-100	75-90	60-80	40-55	15-25	NP-5
	4-14	Very cobbly very fine sandy loam, very cobbly fine sandy loam.	SM, GM	A-4, A-2-4	0-5	30-45	65-75	60-70	50-60	30-45	15-25	NP-5
	14-18	Extremely cobbly very fine sandy loam, extremely cobbly fine sandy loam.	SM, GM	A-4, A-2-4	0-5	50-70	55-70	50-65	35-55	25-40	15-25	NP-5
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Canwall------	0-3	Fine sandy loam.	SM	A-2	0	0-5	80-95	75-90	60-80	25-35	15-20	NP-5
	3-12	Very fine sandy loam, fine sandy loam.	SM, ML	A-4	0	0-10	80-90	75-90	65-75	45-55	15-25	NP-5
	12-24	Very cobbly very fine sandy loam, very cobbly fine sandy loam.	SM	A-4, A-2-4	0-25	40-60	65-75	55-70	45-60	25-40	15-25	NP-5
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
194----------- Pinelli	0-6	Clay loam-----	CL	A-6, A-7	0	0	100	95-100	75-90	70-85	35-45	15-25
	6-28	Clay, silty clay, clay loam.	CL, CH	A-7	0	0	100	95-100	85-95	70-90	40-55	15-30
	28-60	Clay loam-----	CL	A-6, A-7	0	0	95-100	95-100	75-90	65-80	35-45	15-20
195*. Pits, mine												
196*:												
Poin---------	0-6	Very cobbly sandy loam.	SM	A-2, A-4	0	45-55	85-95	70-80	50-65	20-40	15-25	NP-5
	6-15	Very channery sandy loam.	GP-GM, GM	A-1	0	45-55	40-55	35-50	20-35	10-20	15-25	NP-5
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
196*:												
Bowen--------	0-8	Gravelly sandy loam.	SM	A-2	0-5	0-10	70-80	65-75	45-50	25-35	15-25	NP-5
	8-22	Very gravelly sandy loam, very gravelly sandy clay loam.	SC, SC-SM, GC, GM-GC	A-2, A-1-B	0-5	10-20	45-65	35-55	25-45	15-30	25-35	5-15
	22-31	Very gravelly sandy loam, very cobbly sandy loam.	SM, GM	A-1	0-5	20-55	45-65	35-55	25-45	10-25	15-25	NP-5
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
197*:												
Poposhia-----	0-2	Fine sandy loam.	SM	A-4	0	0	95-100	90-100	80-90	35-50	15-25	NP-5
	2-60	Loam, clay loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-90	50-70	25-35	10-20
Blazon-------	0-2	Loam----------	CL	A-6	0	0	90-100	90-100	70-90	60-75	30-35	10-15
	2-12	Clay loam-----	CL	A-6	0	0	90-100	90-100	75-90	65-80	35-40	15-20
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
198*:												
Poposhia-----	0-2	Loam----------	CL-ML	A-4	0	0	95-100	90-100	80-90	55-75	25-30	5-10
	2-60	Loam, clay loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-90	50-70	25-35	10-20
Forelle------	0-2	Fine sandy loam.	SC-SM, SM	A-4	0	0	95-100	90-100	70-80	35-50	15-25	NP-10
	2-17	Loam, clay loam.	CL	A-6	0	0	95-100	90-100	80-90	65-75	30-40	10-20
	17-60	Loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-90	50-75	30-40	10-20
199*:												
Poposhia-----	0-5	Loam----------	CL-ML	A-4	0	0	95-100	90-100	80-90	55-75	25-30	5-10
	5-60	Loam, clay loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-90	50-70	25-35	10-20
Chaperton----	0-3	Clay loam-----	CL	A-6	0	0	95-100	90-100	80-90	55-75	35-40	15-20
	3-13	Clay loam-----	CL	A-6	0	0	95-100	90-100	80-90	55-75	35-40	15-20
	13-25	Clay loam-----	CL	A-6	0	0	95-100	90-100	80-90	55-75	35-40	15-20
	25	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
200*:												
Rainbolt-----	0-2	Gravelly sandy loam.	SC-SM	A-2	0	0	90-100	65-70	45-60	25-35	20-25	5-10
	2-16	Gravelly sandy clay loam, sandy clay loam.	SC	A-2, A-6	0	0	80-100	60-90	40-65	30-50	30-35	10-15
	16-28	Sandy clay loam.	SC, CL	A-6	0	0	100	85-100	70-80	40-60	30-35	10-15
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Morset-------	0-2	Gravelly sandy loam.	SC-SM	A-2, A-1-B	0	0	60-80	55-75	35-55	15-35	20-30	5-10
	2-13	Gravelly sandy clay loam.	GC, SC	A-2, A-6	0	0	55-80	50-75	35-55	20-45	30-40	10-20
	13-60	Gravelly sandy clay loam, gravelly sandy loam.	GC, SC, SC-SM, GM-GC	A-2, A-1-B	0	0	55-80	50-75	35-55	20-35	25-35	5-15
201*:												
Redfeather---	0-14	Fine sandy loam.	SM, SC-SM	A-2-4, A-4	0	0-5	85-95	75-85	60-75	25-40	15-30	NP-10
	14-19	Very gravelly sandy clay loam.	GC, GP-GC	A-2	0	0	45-55	25-45	15-30	10-25	30-35	10-15
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Lakehelen----	0-18	Fine sandy loam.	SM	A-4	0	0	90-100	85-100	70-80	35-50	<25	NP-5
	18-38	Very gravelly sandy clay loam.	GC	A-2	0	0	45-55	40-50	30-40	20-35	30-40	10-20
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rogert-------	0-4	Gravelly sandy loam.	SM, SC-SM, GM, GM-GC	A-1, A-2	0	0-5	60-80	50-75	40-60	20-35	<25	NP-10
	4-18	Very gravelly sandy loam.	GP-GM, GM, GM-GC	A-1, A-2	0	0-5	35-55	25-40	15-25	10-15	<25	NP-10
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
202----------- Redrob	0-23	Loam----------	CL-ML	A-4	0	0	95-100	95-100	85-95	50-70	25-30	5-10
	23-33	Sandy clay loam, loam.	SC, CL	A-6	0	0	95-100	90-100	75-85	45-65	30-40	10-15
	33-60	Very gravelly sand, very gravelly loamy sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-20	40-55	35-50	20-40	2-15	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
203*:												
Redrob, frequently flooded-----	0-14	Loam----------	CL-ML	A-4	0	0	95-100	95-100	70-85	50-70	25-30	5-10
	14-23	Stratified fine sandy loam to silt loam.	CL-ML, SC-SM, CL, SC	A-4, A-6	0	0	95-100	95-100	65-80	40-60	25-35	5-15
	23-60	Very gravelly sand, very gravelly loamy sand.	GM, GP-GM	A-1	0	0-20	40-55	35-50	20-35	5-15	---	NP
Grenoble-----	0-5	Gravelly sandy loam.	SM	A-1, A-2	0	0	85-90	50-70	35-50	20-35	15-25	NP-5
	5-60	Very gravelly loamy sand, very gravelly sand.	SP-SM, GP, SM, GP-GM	A-1	0	0	50-65	35-50	25-35	0-20	---	NP
Redrob-------	0-5	Very fine sandy loam.	SC-SM, CL-ML	A-4	0	0	95-100	90-100	85-95	40-55	20-25	5-10
	5-21	Loam----------	CL-ML	A-4	0	0	95-100	90-100	85-95	60-85	25-30	5-10
	21-38	Sandy clay loam, loam.	SC, CL	A-6	0	0	95-100	90-100	75-85	45-65	30-40	10-15
	38-60	Very gravelly sand, very gravelly loamy sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-20	40-55	35-50	20-40	2-15	---	NP
204*:												
Redrob, frequently flooded-----	0-23	Loam----------	CL-ML	A-4	0	0	95-100	95-100	70-85	50-70	25-30	5-10
	23-35	Sandy clay loam, loam.	CL	A-6	0	0	95-100	90-100	75-85	60-80	30-35	10-15
	35-60	Very gravelly sand, very gravelly loamy sand.	GM, GP-GM	A-1	0	0-20	40-55	35-50	20-35	5-15	---	NP
Redrob-------	0-18	Loam----------	CL-ML	A-4	0	0	95-100	95-100	85-95	50-70	25-30	5-10
	18-25	Sandy clay loam, loam.	SC, CL	A-6	0	0	95-100	90-100	75-85	45-65	30-40	10-15
	25-60	Very gravelly sand, very gravelly loamy sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-20	40-55	35-50	20-40	2-15	---	NP

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
205*:												
Redrob, frequently flooded-----	0-14	Loam----------	CL-ML	A-4	0	0	95-100	95-100	70-85	50-70	25-30	5-10
	14-23	Stratified fine sandy loam to silt loam.	CL-ML, SC-SM, CL, SC	A-4, A-6	0	0	95-100	95-100	65-80	40-60	25-35	5-15
	23-60	Very gravelly sand, very gravelly loamy sand.	GM, GP-GM	A-1	0	0-20	40-55	35-50	20-35	5-15	---	NP
Redrob-------	0-5	Very fine sandy loam.	SC-SM, CL-ML	A-4	0	0	95-100	90-100	85-95	40-55	20-25	5-10
	5-20	Loam----------	CL-ML	A-4	0	0	95-100	90-100	85-95	60-85	25-30	5-10
	20-38	Sandy clay loam, loam.	SC, CL	A-6	0	0	95-100	90-100	75-85	45-65	30-40	10-15
	38-60	Very gravelly sand, very gravelly loamy sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-20	40-55	35-50	20-40	2-15	---	NP
Urban land.												
206*:												
Rentsac------	0-3	Channery sandy loam.	SM	A-2	0	5-15	90-95	70-85	55-65	25-35	<25	NP-5
	3-6	Very channery sandy loam, very channery loam.	GM-GC	A-2, A-1	0	5-15	40-55	35-50	25-40	10-30	25-30	5-10
	6-14	Extremely channery sandy loam, extremely channery loam.	GM-GC	A-2, A-1	0-15	30-45	25-40	20-35	15-30	10-25	25-30	5-10
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Wycolo-------	0-7	Sandy loam----	SM, SC-SM	A-4	0	0	90-100	85-100	70-80	35-50	15-25	NP-5
	7-16	Sandy clay loam.	CL, SC	A-6	0	0	90-100	85-100	75-90	35-55	30-40	10-20
	16-23	Sandy loam, sandy clay loam.	SC-SM, SC	A-4	0	0	85-95	75-90	65-75	35-50	25-30	5-10
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
207*:												
Renvers------	0-1	Very stony loam.	SM, SC-SM, GM, GM-GC	A-4	25-50	10-20	65-85	60-80	50-75	40-50	<30	NP-10
	1-4	Very stony fine sandy loam.	SM, SC-SM, GM, GM-GC	A-2, A-4	25-50	10-20	65-85	60-85	50-75	25-40	<30	NP-10
	4	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
207*:												
Chalkhill----	0-2	Sandy loam----	SC-SM, SM	A-4, A-2	0	0	100	85-100	65-75	25-45	<25	NP-5
	2-11	Sandy clay loam, clay loam.	SC, CL	A-6	0	0-10	90-100	85-100	85-90	45-65	30-40	10-20
	11-14	Extremely channery sandy clay loam, extremely channery clay loam.	GC	A-2-6	0-5	40-60	25-45	20-40	17-35	10-30	30-40	10-20
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
208*:												
Rimton-------	0-4	Very fine sandy loam.	ML, CL-ML	A-4	0	0-5	90-100	80-95	70-90	50-65	20-30	NP-10
	4-15	Fine sandy loam.	SC-SM	A-2, A-4	0	0-5	90-100	80-95	70-85	25-50	20-25	5-10
	15-32	Sandy clay loam, cobbly sandy clay loam.	SC	A-6	0	10-30	85-95	80-90	70-90	35-50	30-40	10-20
	32-39	Very cobbly fine sandy loam, very cobbly sandy clay loam.	SC-SM, SC	A-4, A-6, A-2-4, A-2-6	0-10	30-55	70-80	60-70	50-60	30-40	25-35	5-15
	39	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Passcreek, cobbly subsoil-----	0-7	Fine sandy loam.	ML, CL-ML, SM, SC-SM	A-4	0-5	0-10	95-100	95-100	85-95	40-55	15-30	NP-10
	7-17	Cobbly fine sandy loam, cobbly sandy clay loam.	SC-SM, SC	A-2-4, A-2-6, A-4, A-6	0-5	20-40	75-85	70-80	55-65	30-50	25-35	5-15
	17-26	Very cobbly fine sandy loam.	SM, SC-SM	A-2, A-1-B	0-5	50-65	60-80	50-70	40-60	20-35	15-30	NP-10
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Miracle------	0-6	Fine sandy loam.	SM	A-2, A-4	0	0	90-100	85-100	65-85	25-45	<25	NP-5
	6-31	Sandy clay loam.	SC-SM	A-2, A-4	0	0	90-100	85-100	75-80	30-50	25-30	5-10
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
209*. Riverwash												
210*: Rock outcrop.												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
210*:												
Bonjea-------	0-3	Sandy loam----	SM, SC-SM	A-2, A-4	0	0	90-100	90-100	60-90	30-40	20-30	NP-10
	3-13	Sandy clay loam, gravelly sandy clay loam.	SC	A-6	0	0	70-90	65-85	50-75	35-50	30-35	10-15
	13-17	Gravelly sandy clay loam, very gravelly sandy clay loam.	SC	A-2	0	0	75-90	35-75	25-45	15-35	30-35	10-15
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
211*:												
Rock outcrop.												
Bruja--------	0-2	Very cobbly fine sandy loam.	SM, SC-SM, GM-GC	A-2	0	25-40	55-75	50-70	45-65	25-35	20-25	NP-5
	2-23	Very cobbly very fine sandy loam, very cobbly fine sandy loam.	SM, SC-SM, GM-GC	A-2	0-15	30-40	55-70	45-60	40-50	25-35	20-25	NP-5
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Byrnie-------	0-2	Gravelly fine sandy loam.	SC-SM, GC, SC, GM-GC	A-2, A-4	0	0-5	60-80	55-75	45-60	25-45	20-25	5-10
	2-12	Gravelly sandy loam, gravelly fine sandy loam.	SM, GM	A-2, A-1, A-4	0	0-10	55-80	50-75	40-60	20-40	15-25	NP-5
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
212*:												
Rock outcrop.												
Cathedral----	0-2	Very stony coarse sandy loam.	GM, GM-GC	A-1	40-50	0-15	50-60	35-45	25-30	10-25	15-25	NP-5
	2-13	Very gravelly coarse sandy loam, very gravelly sandy loam.	GM, GM-GC	A-1	0-10	0-20	45-60	30-50	20-35	10-25	15-25	NP-5
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
213*:												
Rock outcrop.												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
213*:												
Cathedral----	0-2	Very gravelly sandy loam.	GM, GM-GC	A-1	0-10	0-20	45-60	30-50	25-35	10-25	15-25	NP-5
	2-10	Very gravelly coarse sandy loam, very gravelly sandy loam.	GM, GM-GC	A-1	0-10	0-20	45-60	30-50	20-35	10-25	15-25	NP-5
	10	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Alderon------	0-2	Sandy loam----	SM, SC-SM	A-2, A-4	0	0	100	85-90	55-65	20-40	15-30	NP-10
	2-7	Sandy clay loam.	SC	A-6, A-2	0	0	100	85-90	45-60	30-50	30-35	10-15
	7-26	Gravelly sandy clay loam.	SC	A-2	0	0	70-80	50-65	30-40	20-35	30-35	10-15
	26-39	Very gravelly coarse sandy loam, very gravelly sandy loam.	GM, SM, GP-GM, SP-SM	A-1	0	0	50-60	35-50	20-35	10-20	15-25	NP-5
	39	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
214*: Rock outcrop.												
Pilotpeak----	0-4	Cobbly fine sandy loam.	SM	A-2, A-4	0-5	15-30	80-100	75-90	60-80	30-50	15-25	NP-5
	4-11	Very cobbly very fine sandy loam, very cobbly fine sandy loam.	SM, GM	A-4, A-2-4	0-5	30-45	65-75	60-70	50-60	30-45	15-25	NP-5
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
215*: Rock outcrop.												
Rogert-------	0-4	Gravelly fine sandy loam.	SM, SC-SM, GM, GM-GC	A-1, A-2	0	0-5	60-80	50-75	40-60	20-35	<25	NP-10
	4-11	Very gravelly sandy loam.	GP-GM, GM, GM-GC	A-1, A-2	0	0-5	35-55	25-40	15-25	10-15	<25	NP-10
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
216----------- Rock River	0-3	Sandy loam----	SC-SM	A-2, A-4	0	0	95-100	95-100	65-80	30-50	25-30	5-10
	3-17	Sandy clay loam.	SC, CL	A-6	0	0	95-100	95-100	75-90	40-60	30-40	10-20
	17-60	Fine sandy loam, sandy loam.	SM, SC-SM	A-4	0	0-5	95-100	95-100	75-85	35-50	20-30	NP-10

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
217----------- Rock River	0-3	Loam----------	CL	A-6	0	0	95-100	95-100	75-90	50-70	25-30	10-15
	3-21	Sandy clay loam.	SC, CL	A-6	0	0	95-100	95-100	75-90	40-60	30-40	10-20
	21-60	Fine sandy loam, sandy loam.	SM, SC-SM	A-4	0	0-5	95-100	95-100	75-85	35-50	20-30	NP-10
218*:												
Rock River---	0-3	Sandy loam----	SC-SM	A-2, A-4	0	0	95-100	95-100	65-80	30-50	25-30	5-10
	3-17	Sandy clay loam.	SC, CL	A-6	0	0	95-100	95-100	75-90	40-60	30-40	10-20
	17-60	Fine sandy loam, sandy loam.	SM, SC-SM	A-4	0	0-5	95-100	95-100	75-85	35-50	20-30	NP-10
Urban land.												
219*:												
Rogert-------	0-3	Gravelly sandy loam.	SM, SC-SM, GM, GM-GC	A-1, A-2	0	0-5	60-80	50-75	40-60	20-35	<25	NP-10
	3-16	Very gravelly sandy loam.	GP-GM, GM, GM-GC	A-1, A-2	0	0-5	35-55	25-40	15-25	10-15	<25	NP-10
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Lakehelen----	0-15	Sandy loam----	SM	A-2, A-4	0	0	90-100	85-100	65-75	30-45	<25	NP-5
	15-27	Very gravelly sandy clay loam.	GC	A-2	0	0	45-55	40-50	30-40	20-35	30-40	10-20
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
220*:												
Rogert-------	0-4	Gravelly sandy loam.	SM, SC-SM, GM, GM-GC	A-1, A-2	0	0-5	60-80	50-75	40-60	20-35	<25	NP-10
	4-14	Very gravelly sandy loam.	GP-GM, GM, GM-GC	A-1, A-2	0	0-5	35-55	25-40	15-25	10-15	<25	NP-10
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
Amesmont-----	0-4	Sandy loam----	SM	A-2	0	0	100	90-100	60-80	25-35	20-25	NP-5
	4-18	Gravelly sandy clay loam.	SC	A-6	0	0	80-90	50-75	40-60	35-45	30-40	10-15
	18-36	Very gravelly loamy sand, very gravelly sandy loam.	SP-SM, SM, GP-GM, GM	A-1	0	0	50-75	25-50	20-30	5-20	0-0	NP
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
221-----------Rohonda	0-3	Fine sandy loam.	SM	A-2, A-4	0	0	95-100	90-100	70-80	30-40	---	NP
	3-15	Sandy loam, fine sandy loam, very fine sandy loam.	SC-SM	A-4, A-2	0	0	85-100	75-100	60-90	30-50	20-25	5-10
	15-31	Fine sandy loam, sandy loam.	SM	A-2	0	0	85-100	75-90	60-80	25-35	<25	NP-5
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
222*:												
Rohonda------	0-6	Fine sandy loam.	SM	A-2, A-4	0	0	95-100	90-100	70-80	30-40	---	NP
	6-21	Sandy loam, fine sandy loam, very fine sandy loam.	SC-SM	A-4, A-2	0	0	85-100	75-100	60-90	30-50	20-25	5-10
	21-38	Fine sandy loam, sandy loam.	SM	A-2	0	0	85-100	75-90	60-80	25-35	<25	NP-5
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Tieside------	0-5	Gravelly sandy loam.	SM, GM	A-2	0	0	55-80	50-75	40-50	25-35	---	NP
	5-13	Sandy loam, fine sandy loam.	SM	A-2	0	0	75-90	75-90	60-80	20-30	---	NP
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
223*:												
Rohonda------	0-7	Fine sandy loam.	SM	A-2, A-4	0	0	95-100	90-100	70-80	30-40	---	NP
	7-21	Sandy loam, fine sandy loam, very fine sandy loam.	SC-SM	A-4, A-2	0	0	85-100	75-100	60-90	30-50	20-25	5-10
	21-33	Fine sandy loam, sandy loam.	SM	A-2	0	0	85-100	75-90	60-80	25-35	<25	NP-5
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Cheadle------	0-7	Very cobbly fine sandy loam.	SM	A-2	0-5	50-65	75-90	65-80	50-65	20-35	---	NP
	7-12	Very cobbly loamy fine sand.	SM	A-2, A-1	0-5	50-65	60-85	55-75	40-55	15-30	---	NP
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
224----------- Ryark	0-3	Loamy sand----	SM	A-2-4	0	0	95-100	95-100	60-70	15-30	---	NP
	3-36	Sandy loam----	SC-SM, SC	A-2-4, A-4	0	0	95-100	95-100	60-70	25-40	<30	5-10
	36-60	Loamy sand----	SM	A-2-4	0	0	95-100	95-100	60-70	15-30	<25	NP-5
225*:												
Shirleybasin-	0-2	Loam----------	CL	A-6, A-7	0	0	100	90-100	75-90	50-75	35-45	15-25
	2-8	Sandy clay loam, clay loam.	CL, SC	A-7	0	0	100	90-100	75-90	45-65	40-50	20-30
	8-27	Clay, clay loam.	CH	A-7	0	0	80-100	75-100	70-95	60-80	50-60	30-35
	27-52	Clay loam, loam, sandy clay loam.	CL	A-6, A-7	0	0	95-100	85-100	75-90	50-75	35-50	15-30
	52-60	Gravelly sandy clay loam.	SC	A-6, A-7, A-2	0	0-10	70-85	60-75	50-65	25-40	35-45	15-25
Twocabin-----	0-4	Gravelly loam	SC, SC-SM, GC, GM-GC	A-4, A-6	0	0-10	60-80	55-75	45-65	35-50	25-35	5-15
	4-11	Very gravelly sandy clay loam, very gravelly clay loam.	GC	A-2	0	0-25	40-50	35-45	30-40	20-35	30-35	10-15
	11-20	Very gravelly sandy clay loam, very gravelly loam.	GC	A-2	0	0-25	40-50	35-45	30-40	20-30	30-35	10-15
	20-60	Loam, clay loam, sandy clay loam.	CL, CL-ML	A-4, A-6	0	0	100	90-100	80-90	50-70	25-35	5-15
Lahtida------	0-2	Loam----------	CL, CL-ML	A-4	0	0	100	90-100	80-90	50-70	25-30	5-10
	2-15	Clay loam, clay.	CL	A-7, A-6	0	0	100	90-100	80-90	55-80	35-50	20-30
	15-28	Loam, sandy clay loam, clay loam.	CL, CL-ML	A-4, A-6	0	0	100	90-100	75-85	55-70	25-35	5-15
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
226----------- Silas	0-22	Loam----------	CL-ML	A-4	0	0	95-100	85-100	75-95	65-75	25-30	5-10
	22-32	Gravelly sandy clay loam, gravelly clay loam.	CL, SC	A-6	0	0	85-90	65-75	45-65	35-55	30-35	10-15
	32-60	Sandy clay loam, clay loam, loam.	CL	A-6	0	0	80-100	75-100	65-85	50-65	30-35	10-15

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
227*: Silas, gravelly substratum--	0-22	Loam----------	CL-ML	A-4	0	0	95-100	85-100	75-95	65-75	25-30	5-10
	22-42	Gravelly sandy clay loam, gravelly clay loam.	CL, SC	A-6	0	0	85-90	65-75	45-65	35-55	30-35	10-15
	42-60	Stratified very gravelly sandy loam to gravelly loamy sand.	GM, SM, GP-GM, SP-SM	A-1	0	0	40-80	35-75	20-30	10-20	---	NP
Vensora------	0-17	Loam----------	CL-ML	A-4	0	0	90-100	85-100	75-90	50-70	25-30	5-10
	17-30	Loam, gravelly loam, sandy clay loam.	CL	A-6	0	0-15	80-100	75-100	65-90	50-70	30-35	10-15
	30-60	Very gravelly sandy clay loam, very gravelly sandy loam.	GC, SC, GM-GC, SC-SM	A-2, A-1	0	0-15	60-70	45-55	35-45	15-30	25-35	5-15
228----------- Stunner	0-3	Sandy loam----	SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	NP-5
	3-12	Loam, clay loam.	CL	A-6	0	0	100	100	90-95	60-75	30-40	15-20
	12-26	Loam, sandy clay loam, clay loam.	CL, SC	A-6	0	0	100	100	85-95	45-65	30-40	10-20
	26-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	NP-5
229*: Stunner------	0-3	Sandy loam----	SM	A-2, A-4	0	0	100	100	70-80	30-45	15-25	NP-5
	3-13	Loam, clay loam.	CL	A-6	0	0	100	100	90-95	60-75	30-40	15-20
	13-25	Loam, sandy clay loam, clay loam.	CL, SC	A-6	0	0	100	100	85-95	45-65	30-40	10-20
	25-60	Loam, sandy clay loam.	CL, SC	A-6	0	0	100	100	80-90	40-60	30-40	10-20
Borollic Camborthids.												
230*: Stunner------	0-1	Fine sandy loam.	SM	A-2, A-4	0	0	100	100	70-80	30-45	15-25	NP-5
	1-10	Loam, clay loam.	CL	A-6	0	0	100	100	90-95	60-75	30-40	15-20
	10-32	Loam, sandy clay loam, clay loam.	CL, SC	A-6	0	0	100	100	85-95	45-65	30-40	10-20
	32-60	Loam, sandy clay loam.	CL, SC	A-6	0	0	100	100	80-90	40-60	30-40	10-20

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
230*:												
Tisworth	0-4	Sandy loam	SC-SM, SM	A-2, A-4	0	0	95-100	95-100	80-90	30-50	15-30	NP-10
	4-19	Clay loam, sandy clay loam.	CL	A-6	0	0	95-100	95-100	80-90	50-75	35-40	15-20
	19-60	Clay loam, sandy clay loam, loam.	CL	A-6	0	0	95-100	95-100	80-90	50-75	30-35	10-15
Blazon	0-2	Loam	CL	A-6	0	0	90-100	90-100	70-90	60-75	30-35	10-15
	2-12	Clay loam	CL	A-6	0	0	90-100	90-100	75-90	65-80	35-40	15-20
	12	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
231*:												
Stunner	0-3	Sandy loam	SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	NP-5
	3-12	Loam, clay loam.	CL	A-6	0	0	100	100	90-95	60-75	30-40	15-20
	12-26	Loam, sandy clay loam, clay loam.	CL, SC	A-6	0	0	100	100	85-95	45-65	30-40	10-20
	26-60	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	0	100	100	70-80	30-45	20-25	NP-5
Urban land.												
232 Teeler	0-6	Very gravelly sandy loam.	GM-GC, GM	A-1, A-2	0	0-15	45-55	40-50	30-40	15-25	20-30	NP-10
	6-14	Very gravelly sandy clay loam.	GC	A-2	0	10-20	35-45	30-40	25-35	10-20	35-40	15-20
	14-60	Very cobbly sandy loam, very gravelly sandy loam.	GM-GC, GM	A-1, A-2-4	0-5	20-35	50-60	40-50	30-40	10-20	20-30	NP-10
233*:												
Thiel	0-3	Gravelly sandy loam.	SM	A-1, A-2	0	0-10	65-70	55-65	40-45	20-30	---	NP
	3-12	Very gravelly sandy clay loam.	GC	A-2	0	0-20	45-55	40-50	35-45	20-30	30-35	10-15
	12-19	Very gravelly sandy loam.	GM	A-1	0	0-5	45-60	35-50	25-35	15-25	15-25	NP-5
	19-60	Very gravelly loamy sand, extremely gravelly loamy sand.	GP-GM	A-1	0	0-5	35-45	20-35	15-25	5-10	---	NP
Lymanson	0-3	Sandy loam	SC-SM	A-4	0	0	100	85-100	60-80	35-50	25-30	5-10
	3-10	Gravelly sandy loam.	SC-SM	A-2, A-4	0	0	70-85	60-75	45-55	25-40	25-30	5-10
	10-18	Gravelly sandy clay loam.	SC	A-2, A-6	0	0	70-85	60-75	55-65	25-40	30-35	10-15
	18-33	Very gravelly loam.	GC	A-2	0	0	40-60	35-50	30-40	25-35	30-35	10-15
	33	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
233*:												
Leavitt------	0-14	Sandy loam----	SM	A-4	0	0	100	95-100	70-75	40-50	20-25	NP-5
	14-22	Clay loam, sandy clay loam.	CL	A-6	0	0	100	95-100	85-95	50-75	30-35	10-15
	22-60	Sandy clay loam, loam, clay loam.	CL, SC	A-6	0	0	95-100	95-100	80-90	45-65	30-35	10-15
234*:												
Tieside------	0-4	Sandy loam----	SM	A-2	0	0	90-100	90-100	70-80	25-35	---	NP
	4-13	Sandy loam, fine sandy loam.	SM	A-2	0	0	75-90	75-90	60-80	20-30	---	NP
	13-19	Sandy loam, coarse sandy loam.	SM	A-2	0	0	80-90	75-85	35-50	25-35	15-25	NP-5
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Pilotpeak----	0-1	Cobbly fine sandy loam.	SM	A-4	0-5	15-20	80-90	75-85	65-75	35-50	15-25	NP-5
	1-5	Very channery fine sandy loam.	GM	A-1-B	0-5	15-20	50-55	45-50	40-45	15-25	15-25	NP-5
	5-11	Extremely channery fine sandy loam.	GM, GP-GM	A-1	0-5	15-25	25-35	20-30	18-25	5-15	15-25	NP-5
	11	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												
235----------- Tismid	0-4	Sandy loam----	SM, SC-SM	A-4	0	0	100	100	75-80	35-50	<25	NP-10
	4-14	Sandy clay loam, clay loam.	SC, CL	A-6	0	0	100	100	85-90	45-65	30-40	10-20
	14-60	Sandy clay loam, loam.	SC, CL	A-6	0	0	90-100	85-100	75-90	40-60	30-40	10-20
236*:												
Tisworth-----	0-5	Loam----------	CL-ML	A-4	0	0	95-100	95-100	80-90	50-70	25-30	5-10
	5-15	Clay loam, sandy clay loam.	CL	A-6	0	0	95-100	95-100	80-90	50-75	35-40	15-20
	15-60	Clay loam, sandy clay loam, loam.	CL	A-6	0	0	95-100	95-100	80-90	50-75	30-40	15-20
Gerdrum Family------	0-1	Loam----------	CL	A-6	0	0	100	100	85-90	60-70	30-35	10-15
	1-16	Clay loam, clay, silty clay loam.	CL	A-7	0	0	100	100	85-95	80-90	45-50	20-25
	16-60	Clay loam, clay, silty clay loam.	CL	A-7	0	0	100	100	85-95	80-90	40-50	20-25

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
237*:												
Tisworth-----	0-2	Sandy clay loam.	SC, CL	A-6	0	0	95-100	95-100	80-90	40-60	30-35	10-15
	2-60	Clay loam, sandy clay loam.	CL	A-6	0	0	95-100	95-100	80-90	50-75	35-40	15-20
Gerdrum Family------	0-2	Sandy loam----	SM, SC-SM	A-4	0	0	100	100	75-80	35-45	15-25	NP-10
	2-36	Clay loam, clay, silty clay loam.	CL	A-7	0	0	100	100	85-95	80-90	45-50	20-25
	36-60	Clay loam, clay, silty clay loam.	CL	A-7	0	0	100	100	85-95	80-90	40-50	20-25
238*:												
Tule---------	0-3	Loam----------	SC, CL	A-6	0	0	95-100	85-100	70-90	45-75	30-35	10-15
	3-12	Loam, sandy clay loam.	SC, CL	A-6	0	0	95-100	85-100	70-90	45-75	30-35	10-15
	12-15	Extremely gravelly loam, very gravelly sandy clay loam.	GC, SC	A-2	0	0	50-60	15-35	13-25	8-20	30-35	10-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Chalkville---	0-2	Loam----------	ML, CL-ML, CL	A-4	0	0	95-100	85-100	75-85	50-70	15-30	NP-10
	2-12	Clay loam, sandy clay loam, gravelly clay loam.	CL, SC	A-6	0	0	75-100	70-95	60-90	45-70	35-40	15-20
	12-15	Extremely gravelly sandy clay loam, very gravelly sandy loam.	GC, GP-GC, GM-GC	A-2, A-1	0	0-15	25-50	20-45	17-30	10-25	25-35	5-15
	15	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
239*:												
Tyzak--------	0-4	Cobbly very fine sandy loam.	SM, ML	A-4	0	15-30	75-90	70-90	65-75	35-55	25-30	NP-5
	4-13	Very cobbly loam, extremely cobbly loam.	GC, SC, CL	A-6, A-2-6	0-10	45-60	50-80	45-75	35-65	25-55	30-35	10-15
	13	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
240----------- Wycolo	0-3	Sandy loam----	SM	A-2, A-4	0	0	100	85-100	70-85	30-50	<25	NP-5
	3-16	Sandy clay loam, loam.	SC, CL	A-6	0	0	95-100	85-100	70-90	40-65	30-35	10-15
	16-40	Loam, clay loam, sandy clay loam.	CL, SC	A-6	0	0	85-100	75-100	65-90	35-65	30-40	10-20
	40	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
241*:												
Wycolo-------	0-6	Fine sandy loam.	SM	A-2, A-4	0	0	100	85-100	70-85	30-50	<25	NP-5
	6-12	Sandy clay loam, loam.	SC, CL	A-6	0	0	95-100	85-100	70-90	40-65	30-35	10-15
	12-25	Loam, clay loam, sandy clay loam.	CL, SC	A-6	0	0	85-100	75-100	65-90	35-65	30-40	10-20
	25-36	Clay loam, loam, sandy clay loam.	CL, SC	A-6	0	0	80-100	75-100	65-90	35-65	30-40	10-20
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Alcova-------	0-4	Gravelly sandy loam.	SM, SC-SM	A-2, A-1	0	0	75-80	70-75	45-55	20-35	20-30	NP-10
	4-24	Gravelly sandy clay loam.	SC, GC	A-2	0	0	60-80	55-75	35-55	20-35	30-35	10-15
	24-60	Very gravelly sandy clay loam.	GC	A-2	0	0	40-55	35-50	20-35	15-25	30-35	10-15
242*:												
Wycolo-------	0-6	Fine sandy loam.	SM	A-2, A-4	0	0	100	85-100	70-85	30-50	<25	NP-5
	6-12	Sandy clay loam, loam.	SC, CL	A-6	0	0	95-100	85-100	70-90	40-65	30-35	10-15
	12-26	Loam, clay loam, sandy clay loam.	CL, SC	A-6	0	0	85-100	75-100	65-90	35-65	30-40	10-20
	26-36	Clay loam, loam, sandy clay loam.	CL, SC	A-6	0	0	80-100	75-100	65-90	35-65	30-40	10-20
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Alcova-------	0-4	Gravelly sandy loam.	SM, SC-SM	A-2, A-1	0	0	75-80	70-75	45-55	20-35	20-30	NP-10
	4-24	Gravelly sandy clay loam.	SC, GC	A-2	0	0	60-80	55-75	35-55	20-35	30-35	10-15
	24-60	Very gravelly sandy clay loam.	GC	A-2	0	0	40-55	35-50	20-35	15-25	30-35	10-15
Urban land.												

See footnote at end of table.

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
243*:												
Wycolo-------	0-2	Sandy loam----	SM	A-2, A-4	0	0	100	85-100	70-85	30-50	<25	NP-5
	2-11	Sandy clay loam, loam.	SC, CL	A-6	0	0	95-100	85-100	70-90	40-65	30-35	10-15
	11-31	Loam, clay loam, sandy clay loam.	CL, SC	A-6	0	0	85-100	75-100	65-90	35-65	30-40	10-20
	31	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Tieside------	0-1	Sandy loam----	SM	A-2	0	0	90-100	90-100	70-80	25-35	---	NP
	1-6	Sandy loam, fine sandy loam.	SM	A-2	0	0	75-90	75-90	60-80	20-30	---	NP
	6-14	Sandy loam, coarse sandy loam.	SM	A-2	0	0	80-90	75-85	35-50	25-35	15-25	NP-5
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
244*:												
Wycolo-------	0-3	Fine sandy loam.	SM	A-2, A-4	0	0	100	85-100	70-85	30-50	<25	NP-5
	3-13	Sandy clay loam, loam.	SC, CL	A-6	0	0	95-100	85-100	70-90	40-65	30-35	10-15
	13-24	Loam, clay loam, sandy clay loam.	CL, SC	A-6	0	0	85-100	75-100	65-90	35-65	30-40	10-20
	24	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Thermopolis--	0-2	Fine sandy loam.	SM	A-4	0	0	90-100	85-100	75-85	40-50	<25	NP-5
	2-14	Silt loam, loam.	CL	A-6	0	0	75-100	75-100	65-95	50-85	30-35	10-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
Rock outcrop.												

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
100-------------- Aberone	0-8	10-17	1.30-1.40	2.0-6.0	0.11-0.13	7.4-7.8	<2	Low-------	0.15	1	5	1-2
	8-15	5-15	1.35-1.45	2.0-6.0	0.06-0.08	7.9-8.4	2-4	Low-------	0.10			
	15-60	5-15	1.40-1.50	6.0-20	0.02-0.03	7.9-9.0	<2	Low-------	0.05			
101*:												
Abston----------	0-2	15-25	1.15-1.25	0.6-2.0	0.16-0.18	6.6-7.8	<2	Low-------	0.32	2	5	1-2
	2-25	35-50	1.20-1.30	<0.06	0.14-0.16	>8.4	2-8	High------	0.37			
	25	---	---	---	---	---	---	----------	----			
Bullock---------	0-2	12-20	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	<2	Low-------	0.32	2	3	1-2
	2-16	25-35	1.25-1.35	0.2-0.6	0.15-0.18	>8.4	2-8	Moderate	0.37			
	16-24	18-24	1.25-1.35	0.6-2.0	0.15-0.17	>8.4	2-8	Low-------	0.37			
	24	---	---	---	---	---	---	----------	----			
102*:												
Alcova----------	0-3	14-18	1.25-1.35	2.0-6.0	0.10-0.12	7.4-8.4	0-2	Low-------	0.20	2	3	1-2
	3-15	22-30	1.25-1.35	0.6-2.0	0.15-0.20	7.4-8.4	0-2	Moderate	0.28			
	15-37	20-27	1.25-1.35	0.6-2.0	0.12-0.15	7.9-9.0	0-2	Moderate	0.28			
	37-60	18-25	1.25-1.35	0.6-2.0	0.10-0.12	7.9-9.0	0-2	Low-------	0.10			
Borollic Camborthids.												
103*:												
Alcova, shallow substratum-----	0-2	20-25	1.15-1.25	0.6-2.0	0.15-0.17	7.4-8.4	0-0	Low-------	0.32	2	6	1-2
	2-16	22-30	1.25-1.35	0.6-2.0	0.15-0.20	7.4-8.4	0-0	Moderate	0.28			
	16-27	18-25	1.25-1.35	0.6-2.0	0.08-0.10	7.9-9.0	0-2	Low-------	0.10			
	27-60	14-18	1.35-1.45	6.0-20	0.03-0.07	7.9-9.0	0-2	Low-------	0.05			
Lupinto---------	0-2	12-16	1.20-1.30	0.6-6.0	0.10-0.13	6.6-7.8	0-2	Low-------	0.10	1	5	1-3
	2-7	22-27	1.25-1.35	0.6-2.0	0.13-0.14	7.4-7.8	0-2	Moderate	0.20			
	7-24	18-26	1.25-1.35	0.6-2.0	0.09-0.10	7.9-9.0	2-4	Moderate	0.10			
	24-60	10-16	1.30-1.40	6.0-20	0.04-0.06	7.9-9.0	2-4	Low-------	0.05			
Dahlquist-------	0-4	15-22	1.15-1.25	0.6-2.0	0.07-0.10	6.6-7.3	0-0	Low-------	0.10	1	8	1-2
	4-20	20-28	1.25-1.35	0.6-2.0	0.05-0.08	6.6-7.8	0-0	Moderate	0.05			
	20-60	8-15	1.35-1.45	6.0-20	0.04-0.06	7.9-9.0	0-2	Low-------	0.05			
104*:												
Alcova, calcareous subsoil--------	0-2	14-18	1.25-1.35	2.0-6.0	0.10-0.12	7.4-8.4	0-0	Low-------	0.20	2	3	1-2
	2-16	22-30	1.25-1.35	0.6-2.0	0.15-0.20	7.4-8.4	0-0	Moderate	0.28			
	16-28	20-30	1.25-1.35	0.6-2.0	0.14-0.18	7.9-9.0	0-2	Moderate	0.28			
	28-60	14-18	1.35-1.45	6.0-20	0.03-0.07	7.9-9.0	0-2	Low-------	0.05			
Rock River------	0-2	10-16	1.25-1.35	2.0-6.0	0.06-0.08	6.6-7.8	0-0	Low-------	0.10	5	7	1-2
	2-10	24-30	1.25-1.35	0.6-2.0	0.10-0.12	6.6-7.8	0-0	Moderate	0.20			
	10-60	20-27	1.30-1.40	0.6-2.0	0.10-0.12	7.4-9.0	0-2	Moderate	0.20			
105-------------- Almy	0-2	10-20	1.15-1.25	0.6-2.0	0.17-0.19	7.4-8.4	0-0	Low-------	0.37	5	5	1-2
	2-11	15-30	1.25-1.35	0.6-2.0	0.17-0.20	7.4-8.4	0-0	Moderate	0.43			
	11-35	18-27	1.30-1.40	0.6-2.0	0.13-0.15	7.9-9.0	0-4	Moderate	0.43			
	35-60	10-20	1.35-1.45	2.0-6.0	0.10-0.12	7.9-9.0	0-4	Low-------	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
106*:												
Almy------------	0-2	10-20	1.15-1.25	0.6-2.0	0.17-0.19	7.4-8.4	0-0	Low-------	0.37	5	5	1-2
	2-16	15-30	1.25-1.35	0.6-2.0	0.17-0.20	7.4-8.4	0-0	Moderate	0.43			
	16-29	18-27	1.30-1.40	0.6-2.0	0.13-0.15	7.9-9.0	0-4	Moderate	0.43			
	29-60	10-20	1.35-1.45	2.0-6.0	0.10-0.12	7.9-9.0	0-4	Low-------	0.37			
Urban land.												
107*:												
Almy------------	0-2	5-15	1.25-1.35	2.0-6.0	0.13-0.15	7.4-8.4	0-0	Low-------	0.32	5	3	1-2
	2-14	15-30	1.25-1.35	0.6-2.0	0.17-0.20	7.4-8.4	0-0	Moderate	0.43			
	14-38	18-27	1.30-1.40	0.6-2.0	0.13-0.15	7.9-9.0	0-4	Moderate	0.43			
	38-60	10-20	1.35-1.45	2.0-6.0	0.10-0.12	7.9-9.0	0-4	Low-------	0.37			
Tismid----------	0-2	20-25	1.20-1.30	0.6-2.0	0.14-0.16	7.4-7.8	<2	Moderate	0.32	5	5	.5-1
	2-7	20-35	1.30-1.40	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	7-14	20-35	1.30-1.40	0.2-0.6	0.16-0.18	>8.4	<2	Moderate	0.37			
	14-60	20-30	1.30-1.40	0.2-0.6	0.13-0.15	>7.8	<4	Moderate	0.37			
108-------------- Alogia	0-3	12-18	1.15-1.25	0.6-2.0	0.16-0.18	7.4-8.4	2-4	Low-------	0.32	5	5	1-2
	3-21	20-35	1.20-1.30	0.6-2.0	0.13-0.15	7.9-9.0	2-8	Moderate	0.37			
	21-41	20-25	1.20-1.30	0.6-2.0	0.13-0.15	7.9-9.0	4-8	Low-------	0.37			
	41-60	20-35	1.20-1.30	0.6-2.0	0.14-0.16	7.4-8.4	4-8	Moderate	0.37			
109*:												
Alogia----------	0-3	12-18	1.15-1.25	0.6-2.0	0.16-0.18	7.4-8.4	2-4	Low-------	0.32	5	5	1-2
	3-21	20-35	1.20-1.30	0.6-2.0	0.13-0.15	7.9-9.0	2-8	Moderate	0.37			
	21-41	20-25	1.20-1.30	0.6-2.0	0.13-0.15	7.9-9.0	4-8	Low-------	0.37			
	41-60	20-35	1.20-1.30	0.6-2.0	0.14-0.16	7.4-8.4	4-8	Moderate	0.37			
Urban land.												
110-------------- Anchutz	0-2	12-16	1.25-1.35	2.0-6.0	0.11-0.13	7.4-8.4	0-2	Low-------	0.24	5	3	.5-1
	2-15	20-30	1.30-1.40	0.6-2.0	0.14-0.16	7.4-8.4	0-2	Moderate	0.32			
	15-39	20-30	1.30-1.40	0.6-2.0	0.15-0.17	8.5-9.0	0-2	Moderate	0.32			
	39-60	12-22	1.40-1.50	2.0-6.0	0.11-0.13	8.5-9.0	0-2	Low-------	0.24			
111*:												
Ansel-----------	0-6	5-15	1.25-1.35	2.0-6.0	0.06-0.08	6.6-7.3	0-0	Low-------	0.20	2	6	.5-2
	6-24	25-35	1.25-1.35	0.6-2.0	0.11-0.13	6.6-7.3	0-0	Moderate	0.20			
	24-60	10-20	1.35-1.45	2.0-6.0	0.04-0.06	6.6-7.3	0-0	Low-------	0.10			
Granile---------	0-2	10-20	1.25-1.35	2.0-6.0	0.07-0.08	6.6-7.3	0-0	Low-------	0.15	4	7	.5-2
	2-15	10-20	1.35-1.45	2.0-6.0	0.04-0.06	6.6-7.3	0-0	Low-------	0.10			
	15-24	25-35	1.25-1.35	0.6-2.0	0.05-0.07	6.6-7.3	0-0	Moderate	0.15			
	24-60	8-18	1.35-1.45	2.0-6.0	0.04-0.06	6.6-7.3	0-0	Low-------	0.10			
112*:												
Bateson---------	0-2	20-27	1.30-1.40	0.6-2.0	0.11-0.13	6.6-7.3	<2	Moderate	0.17	5	7	1-2
	2-21	20-27	1.30-1.40	0.6-2.0	0.11-0.13	7.4-7.8	<2	Moderate	0.17			
	21-29	5-15	1.40-1.50	2.0-6.0	0.05-0.07	7.4-8.4	<2	Low-------	0.10			
	29-60	2-10	1.45-1.55	6.0-20	0.03-0.05	7.9-9.0	<2	Low-------	0.05			
Shirleybasin----	0-2	20-27	1.25-1.35	0.6-2.0	0.18-0.20	6.6-7.3	<2	Moderate	0.32	5	6	1-2
	2-8	30-40	1.25-1.35	0.6-2.0	0.16-0.19	6.6-7.8	<2	High------	0.37			
	8-27	35-45	1.20-1.30	0.06-0.2	0.16-0.19	7.4-8.4	<2	High------	0.37			
	27-60	20-35	1.25-1.35	0.6-2.0	0.16-0.20	7.9-9.0	2-4	Moderate	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
113*:												
Blackhall-------	0-2	5-15	1.25-1.35	2.0-6.0	0.10-0.14	7.4-8.4	0-2	Low-------	0.10	1	8	.5-1
	2-18	5-15	1.40-1.50	2.0-6.0	0.10-0.14	7.9-8.4	2-4	Low-------	0.32			
	18	---	---	---	---	---	---	----------	----			
Browtine, moist----------	0-3	8-15	1.45-1.55	2.0-6.0	0.06-0.08	7.4-8.4	0-2	Low-------	0.10	1	8	1-2
	3-19	10-15	1.40-1.50	2.0-6.0	0.03-0.05	7.9-9.0	0-2	Low-------	0.10			
	19-43	8-15	1.40-1.50	2.0-6.0	0.04-0.07	7.9-9.0	2-4	Low-------	0.10			
	43-60	20-25	1.40-1.50	0.6-2.0	0.04-0.06	7.9-8.4	0-2	Moderate	0.05			
114*:												
Blackhall-------	0-2	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.4-8.4	0-2	Low-------	0.32	1	3	.5-1
	2-16	5-15	1.40-1.50	2.0-6.0	0.10-0.14	7.9-8.4	2-4	Low-------	0.32			
	16	---	---	---	---	---	---	----------	----			
Satanka---------	0-4	5-15	1.25-1.35	2.0-6.0	0.13-0.15	7.4-8.4	0-0	Low-------	0.32	2	3	1-2
	4-9	20-30	1.25-1.35	0.6-2.0	0.14-0.16	7.4-8.4	0-0	Moderate	0.32			
	9-35	17-25	1.35-1.45	0.6-2.0	0.12-0.14	7.9-9.0	0-2	Low-------	0.37			
	35	---	---	---	---	---	---	----------	----			
Rock outcrop.												
115*:												
Blazon----------	0-5	18-27	1.15-1.25	0.6-2.0	0.18-0.20	7.9-9.0	0-2	Moderate	0.32	1	4L	.5-1
	5-15	27-35	1.25-1.35	0.6-2.0	0.16-0.20	7.9-9.0	0-4	Moderate	0.37			
	15	---	---	---	---	---	---	----------	----			
Chaperton-------	0-3	28-35	1.25-1.35	0.6-2.0	0.18-0.20	7.4-7.8	<2	Moderate	0.32	2	6	1-2
	3-15	28-35	1.25-1.35	0.6-2.0	0.18-0.20	7.4-7.8	<2	Moderate	0.32			
	15-24	30-35	1.25-1.35	0.6-2.0	0.18-0.20	7.9-9.0	<2	Moderate	0.32			
	24	---	---	---	---	---	---	----------	----			
116*:												
Blazon----------	0-5	18-27	1.15-1.25	0.6-2.0	0.18-0.20	7.9-9.0	0-2	Moderate	0.32	1	4L	.5-1
	5-15	27-35	1.25-1.35	0.6-2.0	0.16-0.20	7.9-9.0	0-4	Moderate	0.37			
	15	---	---	---	---	---	---	----------	----			
Delphill--------	0-3	27-35	1.05-1.15	0.6-2.0	0.19-0.21	7.9-8.4	0-4	Moderate	0.37	2	4L	.5-1
	3-28	20-35	1.20-1.30	0.6-2.0	0.17-0.19	7.9-9.0	0-4	Moderate	0.37			
	28	---	---	---	---	---	---	----------	----			
117*:												
Bonjea----------	0-4	10-20	1.25-1.35	0.6-2.0	0.11-0.14	6.6-7.8	0-0	Low-------	0.32	1	3	2-4
	4-10	20-30	1.25-1.40	0.6-2.0	0.12-0.14	6.6-7.8	0-0	Moderate	0.28			
	10-15	20-30	1.25-1.40	0.6-2.0	0.07-0.12	6.6-7.8	0-0	Moderate	0.17			
	15	---	---	---	---	---	---	----------	----			
Chugcreek-------	0-4	12-15	1.25-1.35	2.0-6.0	0.11-0.12	6.6-7.3	0-0	Low-------	0.20	2	3	2-5
	4-19	18-20	1.35-1.45	2.0-6.0	0.11-0.12	6.6-7.3	0-0	Low-------	0.20			
	19-29	24-35	1.25-1.35	0.6-2.0	0.13-0.19	6.6-7.8	0-0	Moderate	0.32			
	29-38	24-35	1.25-1.35	0.6-2.0	0.12-0.16	6.6-7.8	0-0	Moderate	0.17			
	38	---	---	---	---	---	---	----------	----			
Rock outcrop.												

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
118*:												
Bonjea----------	0-4	10-20	1.25-1.35	0.6-2.0	0.11-0.14	6.6-7.8	0-0	Low-------	0.32	1	3	2-4
	4-10	20-30	1.25-1.40	0.6-2.0	0.12-0.14	6.6-7.8	0-0	Moderate	0.28			
	10-15	20-30	1.25-1.40	0.6-2.0	0.07-0.12	6.6-7.8	0-0	Moderate	0.17			
	15	---	---	---	---	---	---	----------	----			
Rock outcrop.												
Chugcreek-------	0-5	12-15	1.25-1.35	2.0-6.0	0.11-0.12	6.6-7.3	0-0	Low-------	0.20	2	3	2-5
	5-34	24-35	1.25-1.35	0.6-2.0	0.13-0.19	6.6-7.8	0-0	Moderate	0.32			
	34-36	24-35	1.25-1.35	0.6-2.0	0.12-0.16	6.6-7.8	0-0	Moderate	0.17			
	36	---	---	---	---	---	---	----------	----			
119-------------- Bosler, wet substratum	0-3	14-18	1.25-1.35	2.0-6.0	0.13-0.15	7.9-9.0	2-4	Low-------	0.32	2	3	1-2
	3-20	22-30	1.25-1.35	0.6-2.0	0.14-0.16	7.9-9.0	2-4	Moderate	0.32			
	20-60	0-10	1.45-1.55	6.0-20	0.03-0.05	7.9-9.0	0-4	Low-------	0.05			
120*:												
Bosler----------	0-7	10-20	1.25-1.35	2.0-6.0	0.13-0.15	6.6-7.8	<2	Low-------	0.28	2	3	.5-1
	7-15	20-30	1.25-1.45	0.6-2.0	0.14-0.16	7.4-8.4	<2	Moderate	0.32			
	15-30	15-27	1.25-1.40	0.6-2.0	0.15-0.17	7.9-9.0	<2	Moderate	0.32			
	30-60	0-5	1.40-1.60	6.0-20	0.02-0.04	7.9-9.0	<2	Low-------	0.05			
Borollic Camborthids.												
121*:												
Bosler, wet substratum-----	0-3	14-18	1.25-1.35	2.0-6.0	0.13-0.15	7.9-9.0	2-4	Low-------	0.32	2	3	1-2
	3-20	22-30	1.25-1.35	0.6-2.0	0.14-0.16	7.9-9.0	2-4	Moderate	0.32			
	20-60	0-10	1.45-1.55	6.0-20	0.03-0.05	7.9-9.0	0-4	Low-------	0.05			
Urban land.												
122*:												
Boyle-----------	0-2	10-20	1.40-1.50	2.0-6.0	0.08-0.10	6.6-7.3	<2	Low-------	0.15	1	7	1-3
	2-10	20-28	1.30-1.40	2.0-6.0	0.09-0.11	6.6-7.3	<2	Low-------	0.15			
	10	---	---	---	---	---	---	----------	----			
Alderon---------	0-6	12-19	1.25-1.35	2.0-6.0	0.10-0.12	6.6-7.3	0-2	Low-------	0.10	2	6	1-3
	6-34	20-35	1.25-1.35	0.6-2.0	0.10-0.12	6.6-7.3	0-2	Moderate	0.15			
	34-40	10-18	1.35-1.45	2.0-6.0	0.06-0.07	6.6-7.8	0-2	Low-------	0.10			
	40	---	---	---	---	---	---	----------	----			
Cathedral-------	0-7	5-18	1.20-1.25	6.0-20	0.08-0.10	6.6-7.3	0-0	Low-------	0.10	1	6	2-4
	7-14	5-18	1.20-1.25	6.0-20	0.05-0.07	6.6-7.3	0-0	Low-------	0.05			
	14	---	---	---	---	---	---	----------	----			
123*:												
Boyle-----------	0-3	10-20	1.40-1.50	2.0-6.0	0.08-0.10	6.6-7.3	<2	Low-------	0.15	1	7	1-3
	3-13	20-28	1.30-1.40	2.0-6.0	0.09-0.11	6.6-7.3	<2	Low-------	0.15			
	13	---	---	---	---	---	---	----------	----			
Boyle, thin solum----------	0-2	10-20	1.40-1.50	2.0-6.0	0.08-0.10	6.6-7.3	<2	Low-------	0.15	1	7	1-3
	2-9	20-28	1.30-1.40	2.0-6.0	0.09-0.11	6.6-7.3	<2	Low-------	0.15			
	9	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
124*:												
Boyle-----------	0-3	10-20	1.40-1.50	2.0-6.0	0.08-0.10	6.6-7.3	<2	Low-------	0.15	1	7	1-3
	3-17	20-28	1.30-1.40	2.0-6.0	0.09-0.11	6.6-7.3	<2	Low-------	0.15			
	17	---	---	---	---	---	---	----------	----			
Rock outcrop.												
125*:												
Boyle-----------	0-3	10-20	1.40-1.50	2.0-6.0	0.08-0.10	6.6-7.3	<2	Low-------	0.15	1	7	1-3
	3-6	20-28	1.30-1.40	2.0-6.0	0.11-0.13	6.6-7.3	<2	Low-------	0.15			
	6-12	20-28	1.30-1.40	2.0-6.0	0.09-0.11	6.6-7.3	<2	Low-------	0.15			
	12	---	---	---	---	---	---	----------	----			
Lininger--------	0-7	16-20	1.15-1.25	0.6-2.0	0.15-0.17	6.6-7.8	0-2	Low-------	0.32	2	5	1-3
	7-14	20-30	1.25-1.35	0.6-2.0	0.12-0.14	6.6-7.8	0-2	Moderate	0.20			
	14-24	20-25	1.25-1.35	2.0-6.0	0.10-0.12	6.6-7.8	0-2	Low-------	0.15			
	24	---	---	0.00-0.2	---	---	---	----------	----			
126--------------	0-3	8-12	1.45-1.55	2.0-6.0	0.05-0.08	7.4-8.4	0-2	Low-------	0.10	1	8	1-2
Browtine	3-14	10-15	1.45-1.55	2.0-6.0	0.04-0.07	7.9-8.4	0-2	Low-------	0.05			
	14-31	8-15	1.25-1.40	2.0-6.0	0.04-0.07	7.9-9.0	2-4	Low-------	0.05			
	31-60	8-15	1.45-1.55	2.0-6.0	0.03-0.05	7.9-9.0	0-4	Low-------	0.05			
127*:												
Browtine--------	0-5	8-12	1.45-1.55	2.0-6.0	0.05-0.08	7.4-8.4	0-2	Low-------	0.10	1	8	1-2
	5-12	10-15	1.45-1.55	2.0-6.0	0.04-0.07	7.9-8.4	0-2	Low-------	0.05			
	12-42	8-15	1.25-1.40	2.0-6.0	0.04-0.07	7.9-9.0	2-4	Low-------	0.05			
	42-60	8-15	1.45-1.55	2.0-6.0	0.03-0.05	7.9-9.0	0-4	Low-------	0.05			
Hilltoppe-------	0-3	8-18	1.40-1.55	2.0-6.0	0.06-0.08	7.4-8.4	<2	Low-------	0.10	1	8	1-2
	3-14	8-18	1.45-1.65	2.0-6.0	0.02-0.04	7.9-9.0	<4	Low-------	0.10			
	14-33	---	---	---	---	---	---	----------	----			
	33-60	8-18	1.45-1.65	2.0-6.0	0.02-0.04	7.9-9.0	<4	Low-------	0.05			
128*:												
Bruja-----------	0-5	6-17	1.25-1.35	2.0-6.0	0.06-0.08	7.4-8.4	0-2	Low-------	0.10	1	8	1-2
	5-23	6-17	1.35-1.45	2.0-6.0	0.03-0.05	7.9-8.4	0-2	Low-------	0.05			
	23	---	---	---	---	---	---	----------	----			
Canwall---------	0-3	8-14	1.25-1.35	2.0-6.0	0.09-0.11	7.4-8.4	0-2	Low-------	0.20	2	6	1-2
	3-12	10-18	1.35-1.45	2.0-6.0	0.08-0.11	7.4-8.4	0-2	Low-------	0.20			
	12-26	10-18	1.35-1.45	2.0-6.0	0.02-0.05	7.9-8.4	0-2	Low-------	0.05			
	26	---	---	---	---	---	---	----------	----			
Telecan---------	0-16	6-15	1.25-1.35	2.0-6.0	0.13-0.17	7.4-8.4	0-2	Low-------	0.32	5	3	3-5
	16-60	6-18	1.35-1.45	2.0-6.0	0.10-0.16	7.9-8.4	0-2	Low-------	0.37			
129*:												
Buffork---------	0-7	10-15	1.40-1.50	2.0-6.0	0.10-0.12	6.6-7.3	0-0	Low-------	0.20	2	3	2-4
	7-17	20-25	1.30-1.40	0.6-2.0	0.13-0.15	6.6-7.3	0-0	Moderate	0.28			
	17-26	5-10	1.45-1.55	2.0-6.0	0.08-0.10	6.6-7.3	0-0	Low-------	0.20			
	26	---	---	---	---	---	---	----------	----			
Bucklon---------	0-6	10-17	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.3	<2	Low-------	0.24	1	3	1-3
	6-16	18-25	1.30-1.40	0.6-2.0	0.16-0.18	6.6-7.3	<2	Moderate	0.32			
	16	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
130*:												
Byrnie----------	0-2	9-15	1.25-1.35	2.0-6.0	0.12-0.14	7.9-8.4	0-2	Low-------	0.32	1	3	.5-1
	2-12	9-15	1.35-1.45	2.0-6.0	0.08-0.10	7.9-8.4	0-4	Low-------	0.15			
	12	---	---	---	---	---	---	----------	----			
Rock outcrop.												
131. Calciborolls												
132-------------- Canburn	0-23	18-25	1.20-1.30	0.6-2.0	0.17-0.19	7.4-8.4	<2	Moderate	0.32	5	6	2-4
	23-50	18-27	1.25-1.35	0.6-2.0	0.16-0.18	7.4-8.4	<2	Moderate	0.37			
	50-60	8-18	1.35-1.45	2.0-6.0	0.10-0.12	7.4-8.4	<2	Low-------	0.17			
133-------------- Cantle	0-27	20-27	1.15-1.25	0.6-2.0	0.13-0.15	7.9-9.0	2-8	Moderate	0.32	5	7	3-6
	27-60	25-35	1.20-1.30	0.6-2.0	0.15-0.17	7.9-9.0	4-8	Moderate	0.37			
134*:												
Carbol----------	0-3	15-20	1.25-1.35	2.0-6.0	0.11-0.13	6.6-7.3	0-0	Low-------	0.24	1	3	2-3
	3-10	20-28	1.25-1.35	0.6-2.0	0.14-0.16	6.6-7.3	0-0	Moderate	0.32			
	10-14	20-28	1.25-1.35	0.6-2.0	0.04-0.06	6.6-7.8	0-0	Moderate	0.05			
	14	---	---	0.00-0.2	---	---	---	----------	----			
Rock outcrop.												
135*:												
Carmody---------	0-1	10-14	1.35-1.45	2.0-6.0	0.13-0.15	7.9-8.4	0-2	Low-------	0.32	2	3	.5-1
	1-24	12-16	1.35-1.45	2.0-6.0	0.13-0.15	7.9-8.4	0-2	Low-------	0.37			
	24	---	---	---	---	---	---	----------	----			
Edlin-----------	0-3	10-14	1.25-1.35	2.0-6.0	0.13-0.15	6.6-7.3	<2	Low-------	0.28	5	3	1-2
	3-23	10-18	1.40-1.50	2.0-6.0	0.13-0.15	6.6-7.8	<2	Low-------	0.28			
	23-60	10-18	1.40-1.50	2.0-6.0	0.12-0.14	7.9-8.4	<2	Low-------	0.28			
136*:												
Carmody---------	0-5	10-14	1.35-1.45	2.0-6.0	0.13-0.15	7.9-8.4	0-2	Low-------	0.32	2	3	.5-1
	5-29	12-16	1.35-1.45	2.0-6.0	0.13-0.15	7.9-8.4	0-2	Low-------	0.37			
	29	---	---	---	---	---	---	----------	----			
Ryan Park-------	0-1	5-12	1.30-1.40	2.0-6.0	0.13-0.15	6.6-7.8	<2	Low-------	0.32	5	3	.5-2
	1-23	10-17	1.35-1.45	2.0-6.0	0.13-0.15	7.4-8.4	<2	Low-------	0.32			
	23-60	5-15	1.35-1.45	2.0-6.0	0.13-0.15	7.9-9.0	<2	Low-------	0.32			
137*:												
Cathedral-------	0-7	5-18	1.20-1.25	6.0-20	0.08-0.10	6.6-7.3	0-0	Low-------	0.10	1	6	2-4
	7-16	5-18	1.20-1.25	6.0-20	0.05-0.07	6.6-7.3	0-0	Low-------	0.05			
	16	---	---	---	---	---	---	----------	----			
Spinekop--------	0-2	10-20	1.25-1.35	2.0-6.0	0.12-0.14	6.6-8.4	0-0	Low-------	0.32	5	3	1-2
	2-31	18-35	1.20-1.30	0.2-0.6	0.17-0.20	7.9-9.0	0-4	Moderate	0.37			
	31-60	16-24	1.30-1.40	0.6-2.0	0.15-0.17	7.9-9.0	0-4	Low-------	0.37			
Rock outcrop.												
138-------------- Center Creek	0-3	15-25	1.20-1.25	0.6-2.0	0.16-0.18	6.6-7.3	0-0	Moderate	0.32	5	6	2-4
	3-30	28-35	1.20-1.25	0.6-2.0	0.19-0.21	6.6-7.8	0-0	Moderate	0.37			
	30-37	15-25	1.20-1.25	0.6-2.0	0.15-0.17	6.6-7.8	0-0	Moderate	0.37			
	37-60	5-15	1.30-1.35	2.0-6.0	0.05-0.07	6.6-7.8	0-0	Low-------	0.10			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
139*:												
Chaperton, moderately saline---------	0-4	18-25	1.15-1.25	0.6-2.0	0.16-0.18	7.9-8.4	0-2	Moderate	0.32	2	5	1-2
	4-16	18-25	1.25-1.35	0.6-2.0	0.16-0.18	7.9-8.4	0-2	Moderate	0.32			
	16-35	18-25	1.25-1.35	0.6-2.0	0.16-0.18	8.5-9.0	4-8	Moderate	0.32			
	35	---	---	---	---	---	---	----------	----			
Blazon----------	0-2	27-35	1.20-1.30	0.6-2.0	0.16-0.18	7.9-9.0	0-2	Moderate	0.37	1	4L	.5-1
	2-16	27-35	1.25-1.35	0.6-2.0	0.16-0.20	7.9-9.0	0-4	Moderate	0.37			
	16	---	---	---	---	---	---	----------	----			
140*:												
Chaperton-------	0-1	14-17	1.25-1.35	2.0-6.0	0.08-0.10	7.4-7.8	<2	Low-------	0.15	2	7	1-2
	1-10	28-35	1.25-1.35	0.6-2.0	0.18-0.20	7.4-7.8	<2	Moderate	0.32			
	10-28	30-35	1.25-1.35	0.6-2.0	0.18-0.20	7.9-9.0	<2	Moderate	0.32			
	28	---	---	---	---	---	---	----------	----			
Poposhia--------	0-1	15-20	1.60-1.70	2.0-6.0	0.06-0.08	7.4-8.4	0-2	Low-------	0.10	5	8	1-2
	1-7	18-30	1.30-1.40	0.6-2.0	0.17-0.20	7.4-8.4	0-2	Moderate	0.37			
	7-60	18-30	1.30-1.40	0.6-2.0	0.16-0.19	7.9-9.0	0-4	Moderate	0.37			
141*:												
Cheadle---------	0-3	10-18	1.30-1.35	2.0-6.0	0.12-0.14	6.6-7.3	0-0	Low-------	0.20	1	6	1-3
	3-7	10-18	1.40-1.45	2.0-6.0	0.09-0.11	7.4-7.8	0-0	Low-------	0.10			
	7-10	10-18	1.40-1.45	2.0-6.0	0.07-0.09	7.4-8.4	0-0	Low-------	0.10			
	10	---	---	---	---	---	---	----------	----			
Passcreek, cobbly subsoil--------	0-4	12-20	1.25-1.35	2.0-6.0	0.13-0.15	7.4-8.4	0-0	Low-------	0.28	1	3	2-3
	4-11	20-26	1.25-1.35	0.6-2.0	0.14-0.16	7.4-8.4	0-0	Moderate	0.37			
	11-22	15-20	1.35-1.45	2.0-6.0	0.04-0.08	7.9-8.4	0-0	Low-------	0.05			
	22	---	---	---	---	---	---	----------	----			
Rock outcrop.												
142*:												
Cheadle---------	0-4	10-18	1.30-1.35	2.0-6.0	0.12-0.14	6.6-7.3	0-0	Low-------	0.24	1	3	1-3
	4-10	10-18	1.40-1.45	2.0-6.0	0.07-0.09	7.4-7.8	0-0	Low-------	0.10			
	10	---	---	---	---	---	---	----------	----			
Rock outcrop.												
Miracle---------	0-12	15-20	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	<2	Low-------	0.32	2	3	2-4
	12-24	20-25	1.25-1.35	0.6-2.0	0.13-0.15	6.6-7.8	<2	Low-------	0.37			
	24-38	15-20	1.35-1.45	2.0-6.0	0.10-0.12	6.6-7.8	<2	Low-------	0.24			
	38	---	---	0.00-0.2	---	---	---	----------	----			
143. Cryaquolls												
144. Cryoborolls												
145*:												
Cushool---------	0-3	10-18	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.28	2	3	1-2
	3-16	22-30	1.30-1.40	0.6-2.0	0.14-0.16	6.6-8.4	0-2	Moderate	0.32			
	16-32	10-18	1.40-1.50	2.0-6.0	0.08-0.10	7.9-9.0	0-2	Low-------	0.15			
	32	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
145*:												
Cutback---------	0-1	5-15	1.25-1.35	2.0-6.0	0.12-0.14	6.6-8.4	0-0	Low-------	0.28	2	3	1-2
	1-7	20-35	1.15-1.25	0.6-2.0	0.14-0.16	7.4-8.4	0-0	Moderate	0.32			
	7-17	20-35	1.25-1.35	0.6-2.0	0.15-0.20	7.9-9.0	0-2	Moderate	0.32			
	17-31	5-25	1.30-1.40	2.0-6.0	0.05-0.06	7.9-9.0	0-4	Low-------	0.10			
	31	---	---	---	---	---	---	----------	----			
146*:												
Cushool---------	0-2	10-18	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.28	2	3	1-2
	2-16	22-30	1.30-1.40	0.6-2.0	0.14-0.16	6.6-8.4	0-2	Moderate	0.32			
	16-32	10-18	1.40-1.50	2.0-6.0	0.12-0.14	7.9-9.0	0-2	Low-------	0.20			
	32	---	---	---	---	---	---	----------	----			
Diamondville----	0-8	7-18	1.25-1.35	2.0-6.0	0.13-0.15	7.4-8.4	0-0	Low-------	0.32	2	3	1-2
	8-20	18-35	1.30-1.40	0.6-2.0	0.16-0.20	7.4-8.4	0-0	Moderate	0.37			
	20-38	10-25	1.30-1.40	0.6-2.0	0.14-0.17	7.9-9.0	2-4	Low-------	0.37			
	38	---	---	---	---	---	---	----------	----			
147*:												
Cutback---------	0-2	20-30	1.15-1.25	0.6-2.0	0.12-0.14	6.6-7.8	0-2	Moderate	0.20	2	5	1-2
	2-10	20-35	1.25-1.35	0.6-2.0	0.15-0.20	7.9-8.4	0-2	Moderate	0.32			
	10-20	10-25	1.30-1.40	2.0-6.0	0.05-0.06	7.9-9.0	0-4	Low-------	0.10			
	20-37	5-10	1.45-1.55	6.0-20	0.03-0.04	7.9-9.0	0-4	Low-------	0.05			
	37	---	---	---	---	---	---	----------	----			
Pinelli---------	0-2	20-27	1.15-1.25	0.6-2.0	0.17-0.19	7.4-8.4	0-0	Low-------	0.32	5	6	.5-1
	2-17	35-50	1.20-1.30	0.06-0.2	0.15-0.20	7.4-8.4	0-0	High------	0.37			
	17-60	30-40	1.30-1.40	0.2-0.6	0.19-0.21	7.9-8.4	0-4	Moderate	0.37			
148*:												
Dahlquist-------	0-2	12-18	1.25-1.35	2.0-6.0	0.05-0.07	6.6-7.3	0-0	Low-------	0.05	1	8	1-2
	2-15	20-28	1.25-1.35	0.6-2.0	0.05-0.08	6.6-7.8	0-0	Moderate	0.05			
	15-20	20-28	1.25-1.35	0.6-2.0	0.05-0.08	6.6-7.8	0-0	Moderate	0.05			
	20-60	10-15	1.35-1.45	6.0-20	0.05-0.07	7.9-9.0	0-2	Low-------	0.05			
Rawlins---------	0-2	10-15	1.25-1.35	2.0-6.0	0.11-0.13	6.6-7.8	<2	Low-------	0.28	5	3	1-2
	2-9	20-30	1.30-1.40	0.6-2.0	0.15-0.18	7.4-7.8	<2	Moderate	0.32			
	9-18	10-20	1.40-1.50	2.0-6.0	0.14-0.16	7.9-9.0	<2	Low-------	0.43			
	18-60	10-18	1.40-1.50	2.0-6.0	0.13-0.15	7.9-9.0	<2	Low-------	0.32			
Browtine--------	0-10	10-15	1.35-1.45	2.0-6.0	0.05-0.07	7.4-8.4	<2	Low-------	0.10	1	8	1-2
	10-32	10-15	1.35-1.45	2.0-6.0	0.05-0.07	7.9-9.0	0-2	Low-------	0.10			
	32-60	28-35	1.15-1.25	0.2-0.6	0.14-0.16	7.9-8.4	0-2	Moderate	0.20			
149*:												
Dalecreek-------	0-8	10-20	1.25-1.35	2.0-6.0	0.13-0.15	6.6-8.4	0-0	Low-------	0.28	5	3	2-3
	8-32	18-35	1.25-1.35	0.6-2.0	0.15-0.17	6.6-8.4	0-0	Moderate	0.32			
	32-60	18-35	1.30-1.40	0.6-2.0	0.14-0.16	6.6-8.4	0-0	Moderate	0.32			
Kovich----------	0-8	17-25	1.15-1.25	0.6-2.0	0.15-0.17	6.6-7.8	<2	Low-------	0.32	3	5	1-3
	8-31	19-35	1.30-1.40	0.6-2.0	0.15-0.19	6.6-7.8	<2	Low-------	0.28			
	31-60	18-30	1.30-1.40	0.6-2.0	0.11-0.15	6.6-7.8	<2	Moderate--	0.17			
150*:												
Delphill--------	0-1	20-27	1.15-1.25	0.6-2.0	0.17-0.20	7.9-8.4	0-4	Moderate	0.32	2	4L	.5-1
	1-21	20-35	1.20-1.30	0.6-2.0	0.17-0.19	7.9-9.0	0-4	Moderate	0.37			
	21	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
150*:												
Blazon----------	0-2	27-35	1.20-1.30	0.6-2.0	0.16-0.18	7.9-9.0	0-2	Moderate	0.37	1	4L	.5-1
	2-11	27-35	1.25-1.35	0.6-2.0	0.16-0.20	7.9-9.0	0-4	Moderate	0.37			
	11	---	---	---	---	---	---	----------	----			
151*:												
Diamondville----	0-6	7-18	1.25-1.35	2.0-6.0	0.13-0.15	7.4-8.4	0-0	Low-------	0.32	2	3	1-2
	6-18	18-35	1.30-1.40	0.6-2.0	0.16-0.20	7.4-8.4	0-0	Moderate	0.37			
	18-35	10-25	1.30-1.40	0.6-2.0	0.14-0.17	7.9-9.0	2-4	Low-------	0.37			
	35	---	---	---	---	---	---	----------	----			
Cushool---------	0-3	10-18	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.28	2	3	1-2
	3-15	22-30	1.30-1.40	0.6-2.0	0.14-0.16	6.6-8.4	0-2	Moderate	0.32			
	15-28	10-18	1.40-1.50	2.0-6.0	0.12-0.14	7.9-9.0	0-2	Low-------	0.20			
	28	---	---	---	---	---	---	----------	----			
152*:												
Diamonkit-------	0-1	16-19	1.25-1.35	2.0-6.0	0.10-0.12	7.4-8.4	0-2	Low-------	0.24	3	3	1-2
	1-11	24-32	1.25-1.35	0.6-2.0	0.16-0.17	7.9-9.0	0-2	Moderate	0.37			
	11-33	20-35	---	0.6-2.0	0.12-0.15	7.9-9.0	0-8	Moderate	0.37			
	33	---	---	---	---	---	---	----------	----			
Stylite---------	0-2	10-20	1.15-1.25	2.0-6.0	0.12-0.14	7.4-8.4	0-0	Low-------	0.24	5	3	1-2
	2-14	20-35	1.25-1.35	0.6-2.0	0.16-0.19	7.4-8.4	0-2	Moderate	0.32			
	14-31	18-30	1.25-1.35	0.6-2.0	0.17-0.21	7.9-9.0	0-4	Moderate	0.32			
	31-60	18-30	---	---	0.06-0.10	7.4-8.4	4-8	----------	----			
153------------- Elkol	0-3	28-37	1.10-1.20	0.06-0.2	0.10-0.12	7.9-9.0	2-8	High------	0.37	5	4L	.5-1
	3-34	35-45	1.15-1.25	0.06-0.2	0.08-0.10	7.9-9.0	2-8	High------	0.43			
	34-60	28-37	1.20-1.30	0.06-0.2	0.08-0.10	7.9-9.0	2-8	High------	0.43			
154*:												
Elkol-----------	0-2	28-37	1.10-1.20	0.06-0.2	0.10-0.12	7.9-9.0	2-8	High------	0.37	5	4L	.5-1
	2-30	35-45	1.15-1.25	0.06-0.2	0.08-0.10	7.9-9.0	2-8	High------	0.43			
	30-60	28-35	1.25-1.35	0.2-0.6	0.07-0.09	7.9-9.0	2-8	Moderate	0.43			
Gerdrum Family--	0-1	20-24	1.15-1.25	0.6-2.0	0.15-0.17	7.4-8.4	0-2	Moderate	0.32	5	6	1-2
	1-16	35-45	1.20-1.30	0.00-0.06	0.12-0.15	8.5-9.6	0-4	High------	0.37			
	16-60	30-45	1.20-1.30	0.06-0.2	0.08-0.10	7.9-9.6	8-16	High------	0.37			
155*:												
Elkol-----------	0-5	28-37	1.10-1.20	0.06-0.2	0.10-0.12	7.9-9.0	2-8	High------	0.37	5	4L	.5-1
	5-60	35-45	1.15-1.25	0.06-0.2	0.08-0.10	7.9-9.0	2-8	High------	0.43			
Gerdrum Family--	0-2	20-27	1.15-1.25	0.6-2.0	0.12-0.14	7.9-8.4	0-2	Moderate	0.32	5	4L	.5-1
	2-21	35-45	1.15-1.25	0.00-0.06	0.14-0.18	8.5-9.0	2-4	High------	0.37			
	21-60	28-35	1.25-1.35	0.2-0.6	0.12-0.16	7.9-9.0	8-16	Moderate	0.37			
156------------- Evanston	0-4	10-18	1.25-1.35	2.0-6.0	0.11-0.13	6.6-7.3	0-0	Low-------	0.28	5	3	2-4
	4-14	25-35	1.25-1.35	0.6-2.0	0.16-0.19	7.4-7.8	0-0	Moderate	0.32			
	14-60	25-35	1.25-1.35	0.6-2.0	0.16-0.19	7.9-9.0	0-2	Moderate	0.32			
157*:												
Evanston--------	0-7	18-27	1.20-1.30	0.6-2.0	0.16-0.18	6.6-7.3	0-0	Low-------	0.32	5	6	2-4
	7-20	25-35	1.25-1.35	0.6-2.0	0.16-0.19	7.4-7.8	0-0	Moderate	0.32			
	20-60	25-35	1.25-1.35	0.6-2.0	0.16-0.19	7.9-9.0	0-2	Moderate	0.32			
Bonjea----------	0-5	10-20	1.25-1.35	0.6-2.0	0.11-0.14	6.6-7.8	0-0	Low-------	0.32	1	3	2-4
	5-15	20-30	1.25-1.40	0.6-2.0	0.12-0.14	6.6-7.8	0-0	Moderate	0.28			
	15	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
158*:												
Fiveoh----------	0-6	5-15	1.25-1.35	2.0-6.0	0.11-0.13	7.4-8.4	<2	Low-------	0.32	5	3	1-2
	6-16	8-18	1.35-1.45	2.0-6.0	0.11-0.13	7.9-8.4	<2	Low-------	0.28			
	16-60	8-18	1.35-1.45	2.0-6.0	0.11-0.13	7.9-9.0	2-4	Low-------	0.32			
Fiveoh, cobbly substratum-----	0-3	5-15	1.35-1.45	2.0-6.0	0.12-0.14	7.4-8.4	0-0	Low-------	0.28	5	3	.5-2
	3-22	5-17	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	0-0	Low-------	0.28			
	22-31	5-17	1.35-1.45	2.0-6.0	0.09-0.11	7.9-9.0	0-4	Low-------	0.17			
	31-60	5-10	1.35-1.45	6.0-20	0.05-0.07	7.9-9.0	0-4	Low-------	0.05			
Ryan Park-------	0-3	5-12	1.30-1.40	2.0-6.0	0.13-0.15	6.6-7.8	<2	Low-------	0.32	5	3	.5-2
	3-18	10-17	1.35-1.45	2.0-6.0	0.13-0.15	7.4-8.4	<2	Low-------	0.32			
	18-60	5-15	1.35-1.45	2.0-6.0	0.11-0.13	7.9-9.0	<2	Low-------	0.17			
159*:												
Fiveoh, cobbly substratum-----	0-3	5-15	1.35-1.45	2.0-6.0	0.12-0.14	7.4-8.4	0-0	Low-------	0.28	5	3	.5-2
	3-18	5-17	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	0-0	Low-------	0.28			
	18-41	5-17	1.35-1.45	2.0-6.0	0.09-0.13	7.9-9.0	0-4	Low-------	0.28			
	41-60	5-10	1.35-1.45	6.0-20	0.05-0.07	7.9-9.0	0-4	Low-------	0.05			
Fiveoh----------	0-6	5-15	1.25-1.35	2.0-6.0	0.11-0.13	7.4-8.4	<2	Low-------	0.32	5	3	1-2
	6-16	8-18	1.35-1.45	2.0-6.0	0.11-0.13	7.9-8.4	<2	Low-------	0.28			
	16-60	8-18	1.35-1.45	2.0-6.0	0.11-0.13	7.9-9.0	2-4	Low-------	0.32			
Urban land.												
160*:												
Fiveoh, cobbly substratum-----	0-3	5-15	1.35-1.45	2.0-6.0	0.12-0.14	7.4-8.4	0-0	Low-------	0.28	5	3	.5-2
	3-18	5-17	1.35-1.45	2.0-6.0	0.10-0.14	7.9-8.4	0-0	Low-------	0.28			
	18-41	5-17	1.35-1.45	2.0-6.0	0.09-0.13	7.9-9.0	0-4	Low-------	0.28			
	41-60	5-10	1.35-1.45	6.0-20	0.05-0.07	7.9-9.0	0-4	Low-------	0.05			
Joemre----------	0-4	7-15	1.25-1.35	2.0-6.0	0.14-0.16	7.4-8.4	<2	Low-------	0.32	5	3	1-2
	4-18	10-17	1.30-1.40	2.0-6.0	0.12-0.16	7.9-8.4	<2	Low-------	0.37			
	18-60	10-15	1.30-1.40	2.0-6.0	0.12-0.16	7.9-9.0	<2	Low-------	0.37			
161-------------- Folavar	0-3	12-17	1.25-1.35	2.0-6.0	0.06-0.08	6.6-7.3	0-2	Low-------	0.10	2	8	1-2
	3-11	15-20	1.25-1.35	2.0-6.0	0.06-0.08	6.6-7.8	0-2	Low-------	0.10			
	11-60	0-10	1.45-1.55	6.0-20	0.03-0.04	6.6-7.8	0-2	Low-------	0.05			
162*:												
Folavar---------	0-5	12-17	1.25-1.35	2.0-6.0	0.06-0.08	6.6-7.3	0-2	Low-------	0.10	2	8	1-2
	5-12	15-20	1.25-1.35	2.0-6.0	0.08-0.10	6.6-7.8	0-2	Low-------	0.17			
	12-60	0-10	1.45-1.55	6.0-20	0.03-0.04	6.6-7.8	0-2	Low-------	0.05			
Borollic Camborthids.												
163-------------- Forelle	0-2	18-24	1.15-1.25	0.6-2.0	0.15-0.17	7.4-7.8	0-0	Low-------	0.32	5	5	1-2
	2-22	18-33	1.20-1.30	0.6-2.0	0.18-0.20	7.4-7.8	0-0	Moderate	0.32			
	22-36	18-30	1.25-1.35	0.6-2.0	0.18-0.20	7.9-9.0	0-2	Moderate	0.37			
	36-60	12-18	1.35-1.45	2.0-6.0	0.12-0.14	7.9-9.0	0-2	Low-------	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
164*:												
Forelle----------	0-5	18-24	1.15-1.25	0.6-2.0	0.15-0.17	7.4-7.8	0-0	Low--------	0.32	5	5	1-2
	5-24	18-33	1.20-1.30	0.6-2.0	0.18-0.20	7.4-7.8	0-0	Moderate	0.32			
	24-35	18-30	1.25-1.35	0.6-2.0	0.18-0.20	7.9-9.0	0-2	Moderate	0.37			
	35-60	12-18	1.35-1.45	2.0-6.0	0.12-0.14	7.9-9.0	0-2	Low--------	0.37			
Urban land.												
165*:												
Forelle----------	0-4	12-18	1.25-1.35	2.0-6.0	0.12-0.14	7.4-7.8	0-0	Low--------	0.32	5	3	1-2
	4-15	18-33	1.20-1.30	0.6-2.0	0.18-0.20	7.4-7.8	0-0	Moderate	0.32			
	15-60	18-30	1.25-1.35	0.6-2.0	0.18-0.20	7.9-9.0	0-2	Moderate	0.37			
Diamondville----	0-1	7-18	1.25-1.35	2.0-6.0	0.13-0.15	7.4-8.4	0-0	Low--------	0.32	2	3	1-2
	1-17	18-35	1.30-1.40	0.6-2.0	0.16-0.20	7.4-8.4	0-0	Moderate	0.37			
	17-34	10-25	1.30-1.40	0.6-2.0	0.14-0.17	7.9-9.0	2-4	Low--------	0.37			
	34	---	---	---	---	---	---	-----------	----			
166*:												
Glendive---------	0-6	15-18	1.30-1.35	0.6-2.0	0.16-0.18	7.4-8.4	0-4	Low--------	0.32	5	4L	.5-1
	6-60	10-18	1.30-1.45	2.0-6.0	0.12-0.14	7.4-8.4	0-4	Low--------	0.28			
Redrob-----------	0-5	20-27	1.15-1.25	0.6-2.0	0.16-0.18	7.9-8.4	2-4	Moderate	0.37	2	8	1-3
	5-19	18-25	1.25-1.35	0.6-6.0	0.12-0.17	7.9-8.4	2-4	Low--------	0.28			
	19-24	18-25	1.15-1.25	0.6-2.0	0.09-0.11	7.9-8.4	0-2	Moderate	0.10			
	24-60	2-4	1.50-1.60	>20	0.02-0.04	7.9-8.4	0-2	Low--------	0.02			
Grenoble---------	0-9	10-16	1.25-1.35	2.0-6.0	0.08-0.10	7.4-7.8	0-4	Low--------	0.15	1	6	1-3
	9-60	0-12	1.40-1.50	>20	0.03-0.06	7.4-7.8	0-2	Low--------	0.05			
167*:												
Grenoble---------	0-9	7-13	1.30-1.40	2.0-6.0	0.06-0.08	6.1-7.8	0-0	Low--------	0.10	1	5	1-3
	9-60	0-12	1.40-1.50	>20	0.03-0.06	6.1-7.8	0-0	Low--------	0.05			
Gerrard----------	0-12	20-25	1.15-1.25	0.6-2.0	0.17-0.18	6.6-7.8	0-2	Low--------	0.32	2	5	1-3
	12-24	5-10	1.45-1.55	>20	0.03-0.04	6.6-7.8	0-2	Low--------	0.05			
	24-60	2-7	1.45-1.55	>20	0.03-0.04	6.6-7.8	0-2	Low--------	0.02			
168---------------- Greyback	0-9	12-15	1.30-1.40	6.0-20	0.05-0.07	6.6-7.8	0-0	Low--------	0.05	2	8	2-3
	9-16	10-15	1.40-1.50	6.0-20	0.05-0.07	6.6-7.8	0-0	Low--------	0.05			
	16-30	8-15	1.40-1.50	6.0-20	0.05-0.07	7.9-8.4	0-2	Low--------	0.05			
	30-60	5-12	1.55-1.65	6.0-20	0.03-0.06	7.9-8.4	0-2	Low--------	0.05			
169---------------- Gypla	0-5	10-20	1.20-1.30	0.6-2.0	0.06-0.09	7.4-8.4	>12	Low--------	0.37	5	5	1-2
	5-36	10-18	---	0.6-2.0	0.06-0.09	7.4-8.4	>12	Low--------	0.37			
	36-60	10-18	---	0.6-2.0	0.06-0.09	7.4-8.4	>12	Low--------	0.28			
170*:												
Gypla------------	0-5	10-20	1.20-1.30	0.6-2.0	0.06-0.09	7.4-8.4	>12	Low--------	0.37	5	5	1-2
	5-36	10-18	---	0.6-2.0	0.06-0.09	7.4-8.4	>12	Low--------	0.37			
	36-60	10-18	---	0.6-2.0	0.06-0.09	7.4-8.4	>12	Low--------	0.28			
Urban land.												
171*:												
Hanson-----------	0-8	8-18	1.25-1.35	2.0-6.0	0.07-0.09	7.4-8.4	0-2	Low--------	0.15	1	6	2-4
	8-25	20-30	1.25-1.35	0.6-2.0	0.08-0.11	7.9-9.0	0-4	Moderate	0.05			
	25-60	30-35	1.30-1.40	0.6-2.0	0.09-0.11	7.9-8.4	0-0	Moderate	0.05			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
171*:												
Quander---------	0-12	20-25	1.20-1.30	0.6-2.0	0.11-0.14	6.6-7.3	<2	Moderate	0.17	5	7	2-4
	12-26	28-35	1.20-1.35	0.6-2.0	0.06-0.08	6.6-7.3	<2	Moderate	0.10			
	26-60	28-35	1.20-1.35	0.6-2.0	0.05-0.07	6.6-7.8	<2	Moderate	0.10			
172*:												
Hapjack---------	0-3	5-15	1.25-1.35	2.0-6.0	0.08-0.10	6.6-7.8	0-0	Low-------	0.15	1	6	2-4
	3-10	15-25	1.30-1.40	0.6-2.0	0.10-0.12	6.6-7.8	0-0	Low-------	0.15			
	10-19	5-10	1.45-1.50	2.0-6.0	0.02-0.03	6.6-7.8	0-0	Low-------	0.02			
	19	---	---	---	---	---	---	----------	----			
Rogert----------	0-8	10-18	1.35-1.45	2.0-6.0	0.06-0.09	6.6-7.3	<2	Low-------	0.15	1	6	2-4
	8-16	10-18	1.40-1.50	2.0-6.0	0.04-0.06	6.6-7.8	<2	Low-------	0.05			
	16	---	---	---	---	---	---	----------	----			
Amesmont--------	0-5	5-15	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.32	2	3	1-3
	5-14	20-30	1.25-1.35	0.6-2.0	0.14-0.16	6.6-7.8	0-0	Moderate	0.37			
	14-20	20-30	1.25-1.35	0.6-2.0	0.08-0.12	6.6-7.8	0-0	Moderate	0.15			
	20-33	20-30	1.25-1.35	0.6-2.0	0.04-0.08	6.6-7.8	0-0	Low-------	0.05			
	33	---	---	---	---	---	---	----------	----			
173*:												
Ipson-----------	0-8	10-20	1.30-1.40	2.0-6.0	0.10-0.12	6.6-7.8	<2	Low-------	0.20	1	7	1-3
	8-14	20-30	1.40-1.50	0.6-2.0	0.07-0.09	7.4-7.8	<2	Moderate	0.10			
	14-60	5-15	1.40-1.50	2.0-6.0	0.05-0.07	7.4-7.8	<2	Low-------	0.05			
Evanston--------	0-3	10-18	1.25-1.35	2.0-6.0	0.11-0.13	6.6-7.3	0-0	Low-------	0.28	5	3	2-4
	3-17	25-35	1.25-1.35	0.6-2.0	0.16-0.19	7.4-7.8	0-0	Moderate	0.32			
	17-60	25-35	1.25-1.35	0.6-2.0	0.16-0.19	7.9-9.0	0-2	Moderate	0.32			
174-------------- Joemre	0-2	7-15	1.25-1.35	2.0-6.0	0.14-0.16	7.4-8.4	<2	Low-------	0.32	5	3	1-2
	2-13	10-17	1.30-1.40	2.0-6.0	0.12-0.16	7.9-8.4	<2	Low-------	0.37			
	13-60	10-15	1.30-1.40	2.0-6.0	0.12-0.16	7.9-9.0	<2	Low-------	0.37			
175-------------- Joemre	0-2	7-15	1.25-1.35	2.0-6.0	0.14-0.16	7.4-8.4	<2	Low-------	0.32	5	3	1-2
	2-16	10-17	1.30-1.40	2.0-6.0	0.12-0.16	7.9-8.4	<2	Low-------	0.37			
	16-60	10-15	1.30-1.40	2.0-6.0	0.12-0.16	7.9-9.0	<2	Low-------	0.37			
176*:												
Kezar-----------	0-10	5-15	1.25-1.35	2.0-6.0	0.11-0.13	6.6-7.3	<2	Low-------	0.24	3	3	1-3
	10-20	20-35	1.25-1.35	0.6-2.0	0.14-0.16	6.6-7.3	<2	Moderate	0.32			
	20-31	20-35	1.25-1.35	0.6-2.0	0.08-0.10	6.6-7.3	<2	Moderate	0.10			
	31	---	---	0.00-0.2	---	---	---	----------	----			
Carbol----------	0-4	15-20	1.25-1.35	2.0-6.0	0.11-0.13	6.6-7.3	0-0	Low-------	0.24	1	3	2-3
	4-13	20-28	1.25-1.35	0.6-2.0	0.09-0.11	6.6-7.3	0-0	Moderate	0.17			
	13-19	20-28	1.25-1.35	0.6-2.0	0.04-0.06	6.6-7.8	0-0	Moderate	0.05			
	19	---	---	0.00-0.2	---	---	---	----------	----			
Rock outcrop.												
177*:												
Kildor----------	0-10	15-25	1.20-1.30	0.6-2.0	0.13-0.15	6.6-7.3	0-0	Moderate	0.24	2	7	1-3
	10-22	35-45	1.10-1.20	0.06-0.2	0.17-0.21	6.6-8.4	0-0	High------	0.37			
	22-38	35-45	1.10-1.20	0.06-0.2	0.16-0.20	7.9-8.4	0-0	High------	0.37			
	38	---	---	---	---	---	---	----------	----			
Rock outcrop.												

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
178*:												
Kiltabar--------	0-1	28-35	1.05-1.15	0.2-0.6	0.03-0.05	7.9-9.0	>16	Moderate	0.37	5	4	5-1
	1-40	18-35	1.15-1.25	0.2-0.6	0.08-0.10	7.9-9.0	>16	Moderate	0.32			
	40-60	28-35	1.15-1.25	0.2-0.6	0.08-0.10	7.9-9.0	>8	Moderate	0.32			
Tismid----------	0-4	10-18	1.30-1.40	2.0-6.0	0.11-0.13	7.4-7.8	<2	Low-------	0.28	5	3	5-1
	4-7	20-35	1.30-1.40	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	7-20	20-35	1.30-1.40	0.2-0.6	0.16-0.18	>8.4	<2	Moderate	0.37			
	20-60	20-30	1.30-1.40	0.2-0.6	0.08-0.10	7.9-9.0	8-16	Moderate	0.37			
179*:												
Lakehelen-------	0-17	10-14	1.30-1.40	2.0-6.0	0.12-0.14	6.6-7.3	<2	Low-------	0.20	2	3	.5-1
	17-26	20-30	1.40-1.50	0.6-2.0	0.08-0.10	6.6-7.8	<2	Moderate	0.10			
	26-38	8-12	1.45-1.55	2.0-6.0	0.03-0.05	6.6-7.8	<2	Low-------	0.05			
	38	---	---	---	---	---	---	----------	----			
Redfeather------	0-14	5-15	1.30-1.40	2.0-6.0	0.09-0.11	6.6-7.3	0-0	Low-------	0.10	1	6	.5-1
	14-19	20-30	1.30-1.40	0.6-2.0	0.05-0.07	6.6-7.3	0-0	Moderate	0.05			
	19	---	---	---	---	---	---	----------	----			
Amesmont--------	0-5	5-15	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.32	2	3	1-3
	5-13	20-30	1.25-1.35	0.6-2.0	0.08-0.12	6.6-7.8	0-0	Moderate--	0.15			
	13-21	2-15	1.35-1.45	6.0-20	0.03-0.05	6.6-7.8	0-0	Low-------	0.05			
	21	---	---	---	---	---	---	----------	----			
180-------------- Leavitt	0-6	10-15	1.20-1.30	0.6-6.0	0.11-0.14	6.6-7.3	0-0	Low-------	0.20	5	5	1-3
	6-15	20-27	1.20-1.30	0.6-2.0	0.14-0.16	6.6-7.3	0-0	Moderate	0.24			
	15-22	30-35	1.20-1.30	0.6-2.0	0.12-0.14	7.4-7.8	0-0	Moderate	0.10			
	22-60	5-10	1.30-1.40	2.0-6.0	0.06-0.08	7.9-8.4	0-2	Low-------	0.05			
181*:												
Leavitt---------	0-4	10-15	1.15-1.25	0.6-2.0	0.12-0.14	6.6-7.3	0-0	Low-------	0.17	5	7	2-3
	4-17	28-35	1.25-1.35	0.6-2.0	0.14-0.16	6.6-7.3	0-0	Moderate	0.17			
	17-26	28-35	1.20-1.30	0.6-2.0	0.12-0.14	7.4-8.4	0-0	Moderate	0.15			
	26-60	50-60	1.20-1.30	0.06-0.2	0.14-0.16	7.9-8.4	0-2	High------	0.28			
Granile---------	0-4	10-20	1.25-1.35	2.0-6.0	0.07-0.08	6.6-7.3	0-0	Low-------	0.15	4	7	.5-2
	4-60	25-35	1.25-1.35	0.6-2.0	0.05-0.07	6.6-7.3	0-0	Moderate	0.15			
182*:												
Leavitt---------	0-10	15-20	1.20-1.30	0.6-2.0	0.16-0.18	6.6-7.3	0-0	Low-------	0.32	5	5	1-3
	10-26	25-35	1.10-1.20	0.6-2.0	0.19-0.21	7.4-7.8	0-0	Moderate	0.37			
	26-60	20-30	1.10-1.20	0.6-2.0	0.16-0.20	7.9-8.4	0-2	Moderate	0.37			
Hanson----------	0-8	8-18	1.25-1.35	2.0-6.0	0.07-0.09	7.4-8.4	0-2	Low-------	0.15	1	6	2-4
	8-60	20-30	1.25-1.35	0.6-2.0	0.08-0.11	7.9-9.0	0-4	Moderate	0.05			
183*:												
Leavitt---------	0-5	15-20	1.20-1.30	0.6-2.0	0.16-0.18	6.6-7.3	0-0	Low-------	0.32	5	5	1-3
	5-20	25-35	1.10-1.20	0.6-2.0	0.19-0.21	7.4-7.8	0-0	Moderate	0.37			
	20-60	20-30	1.10-1.20	0.6-2.0	0.16-0.20	7.9-8.4	0-2	Moderate	0.37			
Quander---------	0-10	20-25	1.20-1.30	0.6-2.0	0.11-0.14	6.6-7.3	<2	Moderate	0.17	5	7	2-4
	10-30	28-35	1.20-1.35	0.6-2.0	0.06-0.08	6.6-7.3	<2	Moderate	0.10			
	30-45	28-35	1.20-1.35	0.6-2.0	0.07-0.09	6.6-7.3	<2	Moderate	0.10			
	45-60	28-35	1.20-1.35	0.6-2.0	0.05-0.07	6.6-7.8	<2	Moderate	0.10			
184-------------- Luhon	0-8	16-25	1.10-1.20	0.6-2.0	0.17-0.20	7.4-8.4	<2	Low-------	0.37	5	4L	1-2
	8-60	20-30	1.10-1.20	0.6-2.0	0.19-0.21	8.5-9.0	2-4	Moderate	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
185*:												
Luvar-----------	0-2	16-22	1.20-1.65	0.6-6.0	0.10-0.16	7.4-8.4	0-4	Low--------	0.32	3	4L	1-2
	2-12	20-30	1.20-1.40	0.6-2.0	0.16-0.18	7.4-8.4	0-4	Moderate	0.32			
	12-32	20-30	1.20-1.35	0.6-2.0	0.16-0.18	7.9-9.0	2-8	Moderate	0.32			
	32-60	---	---	---	0.10-0.14	7.4-9.0	4-16	Moderate	0.37			
Stylite---------	0-2	10-20	1.25-1.35	2.0-6.0	0.13-0.15	7.4-8.4	0-0	Low--------	0.28	5	3	1-2
	2-14	20-35	1.25-1.35	0.6-2.0	0.16-0.19	7.4-8.4	0-2	Moderate	0.32			
	14-30	18-30	1.25-1.35	0.6-2.0	0.17-0.21	7.9-9.0	0-4	Moderate	0.32			
	30-60	18-30	---	---	0.06-0.10	7.4-8.4	4-8	-----------	----			
Diamonkit-------	0-1	16-19	1.25-1.35	2.0-6.0	0.10-0.12	7.4-8.4	0-2	Low--------	0.24	3	3	1-2
	1-22	24-32	1.25-1.35	0.6-2.0	0.16-0.17	7.9-9.0	0-2	Moderate	0.37			
	22-35	20-35	---	0.6-2.0	0.12-0.15	7.9-9.0	0-8	Moderate	0.37			
	35	---	---	---	---	---	---	-----------	----			
186*:												
Lymanson loam---	0-7	18-27	1.10-1.20	0.6-2.0	0.16-0.18	6.6-7.8	0-0	Low--------	0.32	2	5	2-4
	7-16	28-35	1.20-1.30	0.6-2.0	0.19-0.21	7.4-7.8	0-0	Moderate	0.37			
	16-35	20-30	1.20-1.30	0.6-2.0	0.17-0.20	7.9-9.0	0-4	Moderate	0.37			
	35	---	---	---	---	---	---	-----------	----			
Lymanson cobbly loam-----------	0-7	15-25	1.10-1.20	0.6-2.0	0.14-0.16	6.6-7.8	0-0	Moderate	0.20	2	7	2-4
	7-17	28-35	1.20-1.30	0.6-2.0	0.19-0.21	7.4-7.8	0-0	Moderate	0.37			
	17-31	20-30	1.20-1.30	0.6-2.0	0.17-0.20	7.9-9.0	0-4	Moderate	0.37			
	31	---	---	---	---	---	---	-----------	----			
187--------------- Manada	0-2	10-15	1.35-1.45	2.0-6.0	0.11-0.13	7.9-8.4	0-2	Low--------	0.28	5	3	2-3
	2-9	10-20	1.30-1.40	0.6-2.0	0.14-0.17	7.9-8.4	0-2	Low--------	0.32			
	9-27	10-15	1.35-1.45	2.0-6.0	0.10-0.12	7.9-9.0	0-2	Low--------	0.17			
	27-35	10-15	1.30-1.40	2.0-6.0	0.13-0.15	7.9-9.0	0-4	Low--------	0.20			
	35-60	10-15	1.35-1.45	2.0-6.0	0.10-0.12	7.9-9.0	0-4	Low--------	0.17			
188--------------- McFadden	0-5	10-17	1.30-1.40	2.0-6.0	0.10-0.12	7.9-8.4	0-2	Low--------	0.17	3	6	1-2
	5-18	10-17	1.30-1.40	2.0-6.0	0.08-0.11	7.9-9.0	0-2	Low--------	0.15			
	18-60	10-17	1.25-1.35	2.0-6.0	0.12-0.15	7.9-9.0	2-4	Low--------	0.28			
189*:												
Miracle---------	0-4	15-20	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	<2	Low--------	0.32	2	3	2-4
	4-28	20-25	1.25-1.35	0.6-2.0	0.13-0.15	6.6-7.8	<2	Low--------	0.37			
	28-33	15-20	1.35-1.45	2.0-6.0	0.10-0.12	6.6-7.8	<2	Low--------	0.24			
	33	---	---	0.00-0.2	---	---	---	-----------	----			
Cheadle---------	0-4	10-18	1.30-1.35	2.0-6.0	0.12-0.14	6.6-7.3	0-0	Low--------	0.24	1	3	1-3
	4-9	10-18	1.30-1.35	2.0-6.0	0.10-0.12	7.4-7.8	0-0	Low--------	0.17			
	9-16	10-18	1.40-1.45	2.0-6.0	0.07-0.09	7.4-7.8	0-0	Low--------	0.10			
	16	---	---	---	---	---	---	-----------	----			
190*:												
Moyerson--------	0-4	35-40	1.05-1.15	0.06-0.2	0.14-0.17	7.4-8.4	2-4	High-------	0.32	2	4L	1-2
	4-17	35-45	1.25-1.30	0.06-0.2	0.14-0.17	7.9-9.0	2-4	High-------	0.32			
	17	---	---	---	---	---	---	-----------	----			
Kemmerer--------	0-2	27-35	1.15-1.25	0.2-0.6	0.20-0.22	6.6-7.8	<2	Moderate	0.32	2	6	.5-1
	2-15	35-45	1.25-1.35	0.06-0.2	0.19-0.21	7.4-8.4	<2	High-------	0.32			
	15-34	35-45	1.20-1.30	0.06-0.2	0.17-0.19	7.9-8.4	<4	High-------	0.37			
	34	---	---	---	---	---	---	-----------	----			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
191*:												
Nathale----------	0-4	8-15	1.25-1.35	2.0-6.0	0.08-0.11	7.4-8.4	<2	Low--------	0.15	1	6	2-3
	4-11	18-25	1.30-1.40	2.0-6.0	0.05-0.09	7.4-8.4	<2	Low--------	0.10			
	11-24	10-20	1.35-1.45	2.0-6.0	0.03-0.05	7.9-8.4	<2	Low--------	0.05			
	24	---	---	---	---	---	---	----------	----			
Passcreek, cobbly subsoil---------	0-7	12-20	1.20-1.30	0.6-2.0	0.14-0.17	7.4-8.4	0-0	Low--------	0.32	1	3	2-3
	7-16	20-26	1.25-1.35	0.6-2.0	0.14-0.16	7.4-8.4	0-0	Moderate	0.37			
	16-31	15-20	1.35-1.45	2.0-6.0	0.04-0.08	7.9-8.4	0-0	Low--------	0.05			
	31	---	---	---	---	---	---	----------	----			
Rock outcrop.												
192--------------- Pahlow	0-3	10-17	1.25-1.35	2.0-6.0	0.07-0.10	7.4-8.4	0-2	Low--------	0.17	3	6	1-2
	3-15	10-18	1.35-1.45	2.0-6.0	0.06-0.09	7.4-8.4	0-4	Low--------	0.15			
	15-60	3-10	1.45-1.55	6.0-20	0.03-0.04	7.9-9.0	2-4	Low--------	0.05			
193*:												
Pilotpeak--------	0-4	6-16	1.25-1.35	2.0-6.0	0.09-0.11	7.9-8.4	2-4	Low--------	0.17	1	6	1-2
	4-14	5-17	1.35-1.45	2.0-6.0	0.05-0.08	7.9-9.0	2-4	Low--------	0.10			
	14-18	5-17	1.35-1.45	2.0-6.0	0.04-0.06	7.9-9.0	2-4	Low--------	0.02			
	18	---	---	---	---	---	---	----------	----			
Canwall----------	0-3	8-14	1.25-1.35	2.0-6.0	0.11-0.14	7.4-8.4	0-2	Low--------	0.32	2	3	1-2
	3-12	10-18	1.35-1.45	2.0-6.0	0.11-0.16	7.4-8.4	0-2	Low--------	0.37			
	12-24	10-18	1.35-1.45	2.0-6.0	0.02-0.05	7.9-8.4	0-2	Low--------	0.05			
	24	---	---	---	---	---	---	----------	----			
194--------------- Pinelli	0-6	28-35	1.10-1.20	0.6-2.0	0.19-0.21	7.4-8.4	0-0	Moderate	0.37	5	6	1-2
	6-28	35-50	1.20-1.30	0.06-0.2	0.15-0.20	7.4-8.4	0-0	High-------	0.37			
	28-60	30-40	1.30-1.40	0.2-0.6	0.19-0.21	7.9-8.4	0-4	Moderate	0.37			
195*. Pits, mine												
196*:												
Poin-------------	0-6	10-15	1.30-1.40	2.0-6.0	0.06-0.08	6.6-7.3	0-0	Low--------	0.10	1	8	2-3
	6-15	10-15	1.30-1.40	2.0-6.0	0.04-0.06	6.6-7.3	0-0	Low--------	0.05			
	15	---	---	---	---	---	---	----------	----			
Bowen------------	0-8	10-15	1.30-1.40	2.0-6.0	0.09-0.10	6.6-7.3	0-0	Low--------	0.15	1	7	1-3
	8-22	18-25	1.25-1.35	0.6-2.0	0.05-0.07	6.6-7.8	0-0	Moderate	0.10			
	22-31	10-15	1.35-1.45	2.0-6.0	0.05-0.07	7.4-7.8	0-0	Low--------	0.10			
	31	---	---	---	---	---	---	----------	----			
Rock outcrop.												
197*:												
Poposhia---------	0-2	15-20	1.40-1.50	2.0-6.0	0.13-0.15	7.4-8.4	0-2	Low--------	0.32	5	3	1-2
	2-60	18-30	1.30-1.40	0.6-2.0	0.16-0.19	7.9-9.0	0-4	Moderate	0.37			
Blazon-----------	0-2	18-27	1.15-1.25	0.6-2.0	0.18-0.20	7.9-9.0	0-2	Moderate	0.32	1	4L	.5-1
	2-12	27-35	1.25-1.35	0.6-2.0	0.16-0.20	7.9-9.0	0-4	Moderate	0.37			
	12	---	---	---	---	---	---	----------	----			
198*:												
Poposhia---------	0-2	18-27	1.20-1.40	0.6-2.0	0.16-0.18	7.4-8.4	0-2	Low--------	0.32	5	4L	1-2
	2-60	18-30	1.30-1.40	0.6-2.0	0.16-0.19	7.9-9.0	0-4	Moderate	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
198*:												
Forelle---------	0-2	12-18	1.25-1.35	2.0-6.0	0.12-0.14	7.4-7.8	0-0	Low-------	0.32	5	3	1-2
	2-17	18-33	1.20-1.30	0.6-2.0	0.18-0.20	7.4-7.8	0-0	Moderate	0.32			
	17-60	18-30	1.25-1.35	0.6-2.0	0.18-0.20	7.9-9.0	0-2	Moderate	0.37			
199*:												
Poposhia--------	0-5	18-27	1.20-1.40	0.6-2.0	0.16-0.18	7.4-8.4	0-2	Low-------	0.32	5	4L	1-2
	5-60	18-30	1.30-1.40	0.6-2.0	0.16-0.19	7.9-9.0	0-4	Moderate	0.37			
Chaperton-------	0-3	28-35	1.25-1.35	0.6-2.0	0.18-0.20	7.4-7.8	<2	Moderate	0.32	2	6	1-2
	3-13	28-35	1.25-1.35	0.6-2.0	0.18-0.20	7.4-7.8	<2	Moderate	0.32			
	13-25	30-35	1.25-1.35	0.6-2.0	0.18-0.20	7.9-9.0	<2	Moderate	0.32			
	25	---	---	---	---	---	---	----------	----			
200*:												
Rainbolt--------	0-2	13-19	1.20-1.30	2.0-6.0	0.10-0.12	7.4-8.4	<2	Low-------	0.15	2	5	2-3
	2-16	20-28	1.10-1.20	0.6-2.0	0.12-0.14	7.9-9.0	2-4	Moderate	0.20			
	16-28	20-25	1.20-1.30	0.6-2.0	0.14-0.15	7.9-9.0	2-4	Moderate	0.28			
	28	---	---	---	---	---	---	----------	----			
Morset----------	0-2	15-20	1.20-1.35	2.0-6.0	0.09-0.11	7.4-7.8	0-0	Low-------	0.15	5	5	1-2
	2-13	20-35	1.25-1.40	0.6-2.0	0.10-0.13	7.4-8.4	0-2	Moderate	0.17			
	13-60	15-25	1.25-1.35	0.6-2.0	0.10-0.13	7.9-9.0	2-4	Moderate	0.17			
201*:												
Redfeather------	0-14	10-18	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.3	0-0	Low-------	0.28	1	3	.5-1
	14-19	20-30	1.30-1.40	0.6-2.0	0.05-0.07	6.6-7.3	0-0	Moderate	0.05			
	19	---	---	---	---	---	---	----------	----			
Lakehelen-------	0-18	10-14	1.30-1.40	2.0-6.0	0.12-0.14	6.6-7.3	<2	Low-------	0.20	2	3	.5-1
	18-38	20-30	1.40-1.50	0.6-2.0	0.08-0.10	6.6-7.8	<2	Moderate	0.10			
	38	---	---	---	---	---	---	----------	----			
Rogert----------	0-4	10-18	1.35-1.45	2.0-6.0	0.06-0.09	6.6-7.3	<2	Low-------	0.15	1	6	2-4
	4-18	10-18	1.40-1.50	2.0-6.0	0.04-0.06	6.6-7.8	<2	Low-------	0.05			
	18	---	---	---	---	---	---	----------	----			
202-------------- Redrob	0-23	20-27	1.20-1.35	0.6-2.0	0.15-0.17	7.4-9.0	2-8	Low-------	0.28	2	5	1-3
	23-33	25-35	1.30-1.45	0.6-2.0	0.15-0.17	7.9-8.4	0-8	Moderate	0.32			
	33-60	2-10	1.35-1.50	>20	0.03-0.04	7.4-8.4	0-2	Low-------	0.05			
203*:												
Redrob, frequently flooded--------	0-14	20-25	1.20-1.35	0.6-2.0	0.17-0.18	7.9-8.4	2-8	Low-------	0.28	2	5	1-3
	14-23	18-27	1.30-1.45	0.6-2.0	0.14-0.17	7.9-8.4	2-8	Low-------	0.28			
	23-60	5-10	1.45-1.60	>20	0.03-0.04	7.9-8.4	0-2	Low-------	0.05			
Grenoble--------	0-5	10-16	1.25-1.35	2.0-6.0	0.08-0.10	7.4-7.8	0-4	Low-------	0.15	1	6	1-3
	5-60	0-12	1.40-1.50	>20	0.03-0.06	7.4-7.8	0-2	Low-------	0.05			
Redrob----------	0-5	15-19	1.25-1.40	2.0-6.0	0.13-0.15	7.9-9.0	2-8	Low-------	0.28	2	3	1-3
	5-21	18-27	1.25-1.40	0.6-2.0	0.16-0.18	7.9-9.0	2-8	Low-------	0.28			
	21-38	25-35	1.30-1.45	0.6-2.0	0.15-0.17	7.9-8.4	0-8	Moderate	0.32			
	38-60	2-10	1.35-1.50	>20	0.03-0.04	7.4-8.4	0-2	Low-------	0.05			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
204*:												
Redrob, frequently flooded	0-23	20-25	1.20-1.35	0.6-2.0	0.17-0.18	7.9-8.4	2-8	Low	0.28	2	5	1-3
	23-35	18-27	1.30-1.40	0.6-2.0	0.15-0.17	7.9-8.4	2-8	Low	0.32			
	35-60	5-10	1.45-1.60	>20	0.03-0.04	7.9-8.4	0-2	Low	0.05			
Redrob	0-18	20-27	1.20-1.35	0.6-2.0	0.15-0.17	7.4-9.0	2-8	Low	0.28	2	5	1-3
	18-25	25-35	1.30-1.45	0.6-2.0	0.15-0.17	7.9-8.4	0-8	Moderate	0.32			
	25-60	2-10	1.35-1.50	>20	0.03-0.04	7.4-8.4	0-2	Low	0.05			
205*:												
Redrob, frequently flooded	0-14	20-25	1.20-1.35	0.6-2.0	0.17-0.18	7.9-8.4	2-8	Low	0.28	2	5	1-3
	14-23	18-27	1.30-1.45	0.6-2.0	0.14-0.17	7.9-8.4	2-8	Low	0.28			
	23-60	5-10	1.45-1.60	>20	0.03-0.04	7.9-8.4	0-2	Low	0.05			
Redrob	0-5	15-19	1.25-1.40	2.0-6.0	0.13-0.15	7.9-9.0	2-8	Low	0.28	2	3	1-3
	5-20	18-27	1.25-1.40	0.6-2.0	0.16-0.18	7.9-9.0	2-8	Low	0.28			
	20-38	25-35	1.30-1.45	0.6-2.0	0.15-0.17	7.9-8.4	0-8	Moderate	0.32			
	38-60	2-10	1.35-1.50	>20	0.03-0.04	7.4-8.4	0-2	Low	0.05			
Urban land.												
206*:												
Rentsac	0-3	10-18	1.25-1.35	2.0-6.0	0.08-0.10	6.6-7.8	<2	Low	0.15	1	6	.5-1
	3-6	10-18	1.30-1.40	2.0-6.0	0.04-0.07	6.6-7.8	<2	Low	0.10			
	6-14	10-18	1.30-1.40	2.0-6.0	0.01-0.03	6.6-7.8	<2	Low	0.05			
	14	---	---	---	---	---	---	---	---			
Wycolo	0-7	8-15	1.25-1.35	0.6-2.0	0.11-0.14	7.4-8.4	0-0	Low	0.32	2	3	1-2
	7-16	20-30	1.25-1.35	0.6-2.0	0.14-0.16	7.4-8.4	0-0	Moderate	0.32			
	16-23	15-25	1.30-1.40	0.6-2.0	0.12-0.15	7.9-8.4	0-0	Low	0.32			
	23	---	---	---	---	---	---	---	---			
207*:												
Renvers	0-1	8-18	1.20-1.30	0.6-2.0	0.16-0.18	6.6-7.8	<2	Low	0.10	1	8	.5-1
	1-4	8-18	1.25-1.35	2.0-6.0	0.13-0.15	6.6-7.8	<2	Low	0.15			
	4	---	---	---	---	---	---	---	---			
Chalkhill	0-2	5-15	1.40-1.50	2.0-6.0	0.10-0.12	6.6-7.8	<2	Low	0.20	1	3	1-2
	2-11	20-35	1.40-1.50	0.6-2.0	0.12-0.14	6.6-7.8	<2	Moderate	0.28			
	11-14	20-35	1.40-1.50	0.6-2.0	0.03-0.05	6.6-7.8	<2	Moderate	0.05			
	14	---	---	---	---	---	---	---	---			
208*:												
Rimton	0-4	12-17	1.20-1.30	0.6-2.0	0.15-0.17	6.6-7.8	0-0	Low	0.32	2	5	1-3
	4-15	15-20	1.35-1.45	0.6-2.0	0.13-0.15	6.6-7.8	0-0	Low	0.24			
	15-32	25-35	1.25-1.35	0.6-2.0	0.12-0.15	6.6-7.8	0-0	Moderate	0.32			
	32-39	17-25	1.30-1.40	0.6-2.0	0.06-0.08	7.4-7.8	0-0	Low	0.05			
	39	---	---	---	---	---	---	---	---			
Passcreek, cobbly subsoil	0-7	12-20	1.25-1.35	2.0-6.0	0.13-0.15	7.4-8.4	0-0	Low	0.28	1	3	2-3
	7-17	18-26	1.25-1.35	0.6-2.0	0.10-0.14	7.4-8.4	0-0	Low	0.17			
	17-26	15-20	1.35-1.45	2.0-6.0	0.04-0.08	7.9-8.4	0-0	Low	0.05			
	26	---	---	---	---	---	---	---	---			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors		Wind erodi- bility group	Organic matter
									K	T		
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
208*:												
Miracle----------	0-6	15-20	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	<2	Low--------	0.32	2	3	2-4
	6-31	20-25	1.25-1.35	0.6-2.0	0.13-0.15	6.6-7.8	<2	Low--------	0.37			
	31	---	---	0.00-0.2	---	---	---	----------	----			
209*. Riverwash												
210*: Rock outcrop.												
Bonjea-----------	0-3	10-20	1.25-1.35	0.6-2.0	0.11-0.14	6.6-7.8	0-0	Low--------	0.32	1	3	2-4
	3-13	20-30	1.25-1.40	0.6-2.0	0.12-0.14	6.6-7.8	0-0	Moderate	0.28			
	13-17	20-30	1.25-1.40	0.6-2.0	0.07-0.12	6.6-7.8	0-0	Moderate	0.17			
	17	---	---	---	---	---	---	----------	----			
211*: Rock outcrop.												
Bruja------------	0-2	6-17	1.25-1.35	2.0-6.0	0.05-0.07	7.4-8.4	0-2	Low--------	0.05	1	8	1-2
	2-23	6-17	1.35-1.45	2.0-6.0	0.05-0.07	7.9-8.4	0-2	Low--------	0.05			
	23	---	---	---	---	---	---	----------	----			
Byrnie-----------	0-2	9-15	1.25-1.35	2.0-6.0	0.10-0.12	7.9-8.4	0-2	Low--------	0.20	1	6	.5-1
	2-12	9-15	1.35-1.45	2.0-6.0	0.08-0.10	7.9-8.4	0-4	Low--------	0.15			
	12	---	---	---	---	---	---	----------	----			
212*: Rock outcrop.												
Cathedral--------	0-2	5-18	1.20-1.30	6.0-20	0.05-0.07	6.6-7.3	0-0	Low--------	0.05	1	8	2-4
	2-13	5-18	1.20-1.25	6.0-20	0.05-0.07	6.6-7.3	0-0	Low--------	0.05			
	13	---	---	---	---	---	---	----------	----			
213*: Rock outcrop.												
Cathedral--------	0-2	5-18	1.20-1.25	6.0-20	0.05-0.07	6.6-7.3	0-0	Low--------	0.05	1	8	2-4
	2-10	5-18	1.20-1.25	6.0-20	0.05-0.07	6.6-7.3	0-0	Low--------	0.05			
	10	---	---	---	---	---	---	----------	----			
Alderon----------	0-2	12-19	1.25-1.35	2.0-6.0	0.11-0.12	6.6-7.3	0-2	Low--------	0.24	2	3	1-3
	2-7	20-35	1.25-1.35	0.6-2.0	0.13-0.15	6.6-7.3	0-2	Moderate	0.32			
	7-26	20-35	1.25-1.35	0.6-2.0	0.10-0.12	6.6-7.3	0-2	Moderate	0.15			
	26-39	10-18	1.35-1.45	2.0-6.0	0.06-0.07	6.6-7.8	0-2	Low--------	0.10			
	39	---	---	---	---	---	---	----------	----			
214*: Rock outcrop.												
Pilotpeak--------	0-4	6-16	1.25-1.35	2.0-6.0	0.07-0.10	7.9-8.4	2-4	Low--------	0.15	1	6	1-2
	4-11	5-17	1.35-1.45	2.0-6.0	0.05-0.08	7.9-9.0	2-4	Low--------	0.10			
	11	---	---	---	---	---	---	----------	----			
215*: Rock outcrop.												
Rogert-----------	0-4	10-18	1.35-1.45	2.0-6.0	0.06-0.09	6.6-7.3	<2	Low--------	0.15	1	6	2-4
	4-11	10-18	1.40-1.50	2.0-6.0	0.04-0.06	6.6-7.8	<2	Low--------	0.05			
	11	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
216-------------- Rock River	0-3	16-18	1.25-1.35	2.0-6.0	0.10-0.12	6.6-7.8	0-0	Low--------	0.24	5	3	1-2
	3-17	20-30	1.25-1.35	0.6-2.0	0.13-0.15	6.6-7.8	0-0	Moderate	0.32			
	17-60	10-18	1.35-1.45	2.0-6.0	0.12-0.14	7.4-9.0	2-4	Low--------	0.37			
217-------------- Rock River	0-3	17-23	1.15-1.25	0.6-2.0	0.15-0.17	6.6-7.8	0-0	Moderate	0.32	5	5	1-2
	3-21	20-30	1.25-1.35	0.6-2.0	0.13-0.15	6.6-7.8	0-0	Moderate	0.32			
	21-60	10-18	1.35-1.45	2.0-6.0	0.12-0.14	7.4-9.0	2-4	Low--------	0.37			
218*:												
Rock River------	0-3	16-18	1.25-1.35	2.0-6.0	0.10-0.12	6.6-7.8	0-0	Low--------	0.24	5	3	1-2
	3-17	20-30	1.25-1.35	0.6-2.0	0.13-0.15	6.6-7.8	0-0	Moderate	0.32			
	17-60	10-18	1.35-1.45	2.0-6.0	0.12-0.14	7.4-9.0	2-4	Low--------	0.37			
Urban land.												
219*:												
Rogert----------	0-3	10-18	1.35-1.45	2.0-6.0	0.06-0.09	6.6-7.3	<2	Low--------	0.15	1	6	2-4
	3-16	10-18	1.40-1.50	2.0-6.0	0.04-0.06	6.6-7.8	<2	Low--------	0.05			
	16	---	---	---	---	---	---	----------	----			
Lakehelen-------	0-15	12-16	1.40-1.50	2.0-6.0	0.10-0.12	6.6-7.3	<2	Low--------	0.20	2	3	.5-1
	15-27	20-30	1.40-1.50	0.6-2.0	0.08-0.10	6.6-7.8	<2	Moderate	0.10			
	27	---	---	---	---	---	---	----------	----			
Rock outcrop.												
220*:												
Rogert----------	0-4	10-18	1.35-1.45	2.0-6.0	0.06-0.09	6.6-7.3	<2	Low--------	0.15	1	6	2-4
	4-14	10-18	1.40-1.50	2.0-6.0	0.04-0.06	6.6-7.8	<2	Low--------	0.05			
	14	---	---	---	---	---	---	----------	----			
Rock outcrop.												
Amesmont--------	0-4	5-15	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low--------	0.32	2	3	1-3
	4-18	20-30	1.25-1.35	0.6-2.0	0.08-0.12	6.6-7.8	0-0	Moderate	0.15			
	18-36	2-15	1.35-1.45	6.0-20	0.03-0.05	6.6-7.8	0-0	Low--------	0.05			
	36	---	---	---	---	---	---	----------	----			
221-------------- Rohonda	0-3	6-12	1.25-1.35	2.0-6.0	0.12-0.14	7.4-8.4	<2	Low--------	0.28	2	3	<1
	3-15	10-17	1.30-1.45	2.0-6.0	0.12-0.16	7.4-8.4	<2	Low--------	0.32			
	15-31	8-14	1.35-1.45	2.0-6.0	0.11-0.14	7.9-8.4	<2	Low--------	0.32			
	31	---	---	---	---	---	---	----------	----			
222*:												
Rohonda---------	0-6	6-12	1.25-1.35	2.0-6.0	0.12-0.14	7.4-8.4	<2	Low--------	0.28	2	3	<1
	6-21	10-17	1.30-1.45	2.0-6.0	0.12-0.16	7.4-8.4	<2	Low--------	0.32			
	21-38	8-14	1.35-1.45	2.0-6.0	0.11-0.14	7.9-8.4	<2	Low--------	0.32			
	38	---	---	---	---	---	---	----------	----			
Tieside---------	0-5	5-15	1.25-1.35	2.0-6.0	0.05-0.07	7.4-8.4	0-2	Low--------	0.10	1	6	1-2
	5-13	5-15	1.35-1.45	2.0-6.0	0.10-0.15	7.9-8.4	0-2	Low--------	0.37			
	13	---	---	---	---	---	---	----------	----			
223*:												
Rohonda---------	0-7	6-12	1.25-1.35	2.0-6.0	0.12-0.14	7.4-8.4	<2	Low--------	0.28	2	3	<1
	7-21	10-17	1.30-1.45	2.0-6.0	0.12-0.16	7.4-8.4	<2	Low--------	0.32			
	21-33	8-14	1.35-1.45	2.0-6.0	0.11-0.14	7.9-8.4	<2	Low--------	0.32			
	33	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
223*:												
Cheadle---------	0-7	8-15	1.25-1.35	2.0-6.0	0.07-0.09	6.6-7.3	0-0	Low-------	0.10	1	8	1-2
	7-12	5-10	1.40-1.50	2.0-6.0	0.04-0.06	7.4-7.8	0-0	Low-------	0.05			
	12	---	---	---	---	---	---	----------	----			
Rock outcrop.												
224-------------- Ryark	0-3	3-8	1.35-1.45	6.0-20	0.07-0.09	6.6-7.8	<2	Low-------	0.15	5	2	1-2
	3-36	10-18	1.35-1.50	2.0-6.0	0.11-0.13	6.6-7.8	<2	Low-------	0.24			
	36-60	3-12	1.45-1.60	6.0-20	0.06-0.08	7.4-7.8	<2	Low-------	0.17			
225*:												
Shirleybasin----	0-2	20-27	1.25-1.35	0.6-2.0	0.18-0.20	6.6-7.3	<2	Moderate	0.32	5	6	1-2
	2-8	30-40	1.25-1.35	0.6-2.0	0.16-0.19	6.6-7.8	<2	High------	0.37			
	8-27	35-45	1.20-1.30	0.06-0.2	0.16-0.19	7.4-8.4	<2	High------	0.37			
	27-52	20-35	1.25-1.35	0.6-2.0	0.16-0.20	7.9-9.0	2-4	Moderate	0.37			
	52-60	20-30	1.25-1.35	0.6-2.0	0.13-0.14	7.9-8.4	<2	Moderate	0.24			
Twocabin--------	0-4	15-25	1.20-1.30	0.6-2.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.24	1	7	.5-1
	4-11	20-35	1.25-1.30	0.6-2.0	0.07-0.09	6.6-7.8	0-0	Moderate	0.10			
	11-20	18-30	1.30-1.40	0.6-2.0	0.07-0.09	7.9-8.4	0-2	Moderate	0.10			
	20-60	15-30	1.30-1.40	0.6-2.0	0.16-0.18	7.9-9.0	0-4	Low-------	0.28			
Lahtida---------	0-2	15-25	1.20-1.30	0.2-0.6	0.16-0.18	6.6-7.8	<2	Low-------	0.32	2	5	1-2
	2-15	35-50	1.20-1.30	0.06-0.2	0.19-0.21	7.4-8.4	<2	High------	0.32			
	15-28	20-35	1.20-1.30	0.2-0.6	0.16-0.18	7.9-9.0	<4	Moderate	0.32			
	28	---	---	---	---	---	---	----------	----			
226-------------- Silas	0-22	17-25	1.15-1.25	0.6-2.0	0.16-0.18	6.6-7.8	<2	Low-------	0.32	5	5	3-4
	22-32	20-30	1.25-1.35	0.6-2.0	0.10-0.14	6.6-7.8	<2	Moderate	0.28			
	32-60	20-30	1.25-1.35	0.6-2.0	0.15-0.20	6.6-7.8	<2	Moderate	0.37			
227*:												
Silas, gravelly substratum-----	0-22	17-25	1.15-1.25	0.6-2.0	0.16-0.18	6.6-7.8	<2	Low-------	0.32	5	5	3-4
	22-42	20-30	1.25-1.35	0.6-2.0	0.10-0.14	6.6-7.8	<2	Moderate	0.24			
	42-60	5-17	1.40-1.50	2.0-6.0	0.05-0.10	6.6-7.8	<2	Low-------	0.10			
Vensora---------	0-17	16-21	1.15-1.25	0.6-2.0	0.15-0.17	6.6-7.8	0-0	Low-------	0.32	2	5	2-4
	17-30	18-27	1.25-1.35	0.6-2.0	0.15-0.17	6.6-7.8	0-0	Moderate	0.37			
	30-60	15-25	1.25-1.35	0.6-2.0	0.07-0.10	6.6-7.8	0-0	Moderate	0.10			
228-------------- Stunner	0-3	15-18	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.32	5	3	1-2
	3-12	22-34	1.25-1.35	0.6-2.0	0.17-0.20	7.4-7.8	0-0	Moderate	0.37			
	12-26	20-32	1.25-1.35	0.6-2.0	0.15-0.17	7.9-9.0	2-4	Moderate	0.37			
	26-60	14-18	1.35-1.45	2.0-6.0	0.12-0.14	7.9-9.0	2-4	Low-------	0.37			
229*:												
Stunner---------	0-3	15-18	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.32	5	3	1-2
	3-13	22-34	1.25-1.35	0.6-2.0	0.17-0.20	7.4-7.8	0-0	Moderate	0.37			
	13-25	20-32	1.25-1.35	0.6-2.0	0.15-0.17	7.9-9.0	2-4	Moderate	0.37			
	25-60	18-30	1.25-1.35	0.6-2.0	0.15-0.17	7.9-9.0	2-4	Moderate	0.37			
Borollic Camborthids.												

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors		Wind erodi- bility group	Organic matter
									K	T		
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
230*:												
Stunner---------	0-1	15-18	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.32	5	3	1-2
	1-10	22-34	1.25-1.35	0.6-2.0	0.17-0.20	7.4-7.8	0-0	Moderate	0.37			
	10-32	20-32	1.25-1.35	0.6-2.0	0.15-0.17	7.9-9.0	2-4	Moderate	0.37			
	32-60	18-30	1.25-1.35	0.6-2.0	0.15-0.17	7.9-9.0	2-4	Moderate	0.37			
Tisworth--------	0-4	8-20	1.25-1.35	2.0-6.0	0.08-0.11	7.4-9.0	0-4	Low-------	0.32	5	3	1-2
	4-19	25-35	1.20-1.30	0.2-0.6	0.08-0.10	8.5-9.6	0-4	Moderate	0.37			
	19-60	18-30	1.25-1.35	0.6-2.0	0.08-0.10	7.9-9.6	4-16	Moderate	0.37			
Blazon----------	0-2	18-27	1.15-1.25	0.6-2.0	0.18-0.20	7.9-9.0	0-2	Moderate	0.32	1	4L	.5-1
	2-12	27-35	1.25-1.35	0.6-2.0	0.16-0.20	7.9-9.0	0-4	Moderate	0.37			
	12	---	---	---	---	---	---	----------	----			
231*:												
Stunner---------	0-3	15-18	1.25-1.35	2.0-6.0	0.12-0.14	6.6-7.8	0-0	Low-------	0.32	5	3	1-2
	3-12	22-34	1.25-1.35	0.6-2.0	0.17-0.20	7.4-7.8	0-0	Moderate	0.37			
	12-26	20-32	1.25-1.35	0.6-2.0	0.15-0.17	7.9-9.0	2-4	Moderate	0.37			
	26-60	14-18	1.35-1.45	2.0-6.0	0.12-0.14	7.9-9.0	2-4	Low-------	0.37			
Urban land.												
232-------------- Teeler	0-6	10-20	1.25-1.35	2.0-6.0	0.06-0.08	6.6-7.8	0-0	Low-------	0.10	5	8	2-4
	6-14	20-25	1.30-1.40	0.6-2.0	0.07-0.09	7.4-7.8	0-0	Low-------	0.10			
	14-60	10-18	1.35-1.45	2.0-6.0	0.05-0.07	7.9-9.0	0-4	Low-------	0.10			
233*:												
Thiel-----------	0-3	5-10	1.35-1.45	2.0-6.0	0.07-0.08	7.4-7.8	0-0	Low-------	0.15	1	7	1-3
	3-12	20-30	1.30-1.40	0.6-2.0	0.06-0.08	7.4-8.4	0-0	Moderate	0.10			
	12-19	5-15	1.35-1.45	2.0-6.0	0.05-0.07	7.9-9.0	0-0	Low-------	0.10			
	19-60	3-10	1.45-1.55	6.0-20	0.03-0.04	7.9-9.0	0-2	Low-------	0.05			
Lymanson--------	0-3	15-20	1.25-1.35	2.0-6.0	0.11-0.13	7.4-8.4	0-0	Low-------	0.28	2	3	2-4
	3-10	15-20	1.35-1.45	2.0-6.0	0.07-0.09	7.4-8.4	0-0	Low-------	0.15			
	10-18	20-27	1.25-1.35	0.6-2.0	0.09-0.12	7.4-8.4	0-0	Moderate	0.20			
	18-33	20-27	1.25-1.35	0.6-6.0	0.05-0.10	7.9-9.0	2-4	Moderate	0.15			
	33	---	---	---	---	---	---	----------	----			
Leavitt---------	0-14	10-15	1.30-1.40	2.0-6.0	0.11-0.13	6.6-7.3	0-0	Low-------	0.24	5	3	1-3
	14-22	25-35	1.10-1.20	0.6-2.0	0.19-0.21	7.4-7.8	0-0	Moderate	0.37			
	22-60	20-30	1.10-1.20	0.6-2.0	0.16-0.20	7.9-8.4	0-2	Moderate	0.37			
234*:												
Tieside---------	0-4	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.4-8.4	0-2	Low-------	0.32	1	3	1-2
	4-13	5-15	1.35-1.45	2.0-6.0	0.10-0.15	7.9-8.4	0-2	Low-------	0.37			
	13-19	5-15	1.35-1.45	2.0-6.0	0.09-0.13	7.9-8.4	0-2	Low-------	0.24			
	19	---	---	---	---	---	---	----------	----			
Pilotpeak-------	0-1	5-15	1.25-1.35	2.0-6.0	0.10-0.12	7.9-8.4	2-4	Low-------	0.20	1	6	1-2
	1-5	5-15	1.35-1.45	2.0-6.0	0.07-0.08	7.9-8.4	2-4	Low-------	0.10			
	5-11	5-15	1.35-1.45	2.0-6.0	0.04-0.06	7.9-9.0	2-4	Low-------	0.02			
	11	---	---	---	---	---	---	----------	----			
Rock outcrop.												
235-------------- Tismid	0-4	10-18	1.30-1.40	2.0-6.0	0.11-0.13	7.4-7.8	<2	Low-------	0.28	5	3	.5-1
	4-14	20-35	1.30-1.40	0.6-2.0	0.14-0.18	7.4-8.4	<2	Moderate	0.32			
	14-60	20-30	1.30-1.40	0.2-0.6	0.13-0.15	>7.8	<4	Moderate	0.37			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
236*:												
Tisworth--------	0-5	15-24	1.15-1.25	0.6-2.0	0.10-0.12	7.4-9.0	0-4	Low-------	0.32	5	4L	1-2
	5-15	25-35	1.20-1.30	0.2-0.6	0.08-0.10	8.5-9.6	4-16	Moderate	0.37			
	15-60	18-30	1.25-1.35	0.6-2.0	0.08-0.10	7.9-9.6	4-16	Moderate	0.37			
Gerdrum Family--	0-1	20-24	1.15-1.25	0.6-2.0	0.15-0.17	7.4-8.4	0-2	Moderate	0.32	5	6	1-2
	1-16	35-45	1.20-1.30	0.00-0.06	0.12-0.15	8.5-9.6	0-4	High------	0.37			
	16-60	30-45	1.20-1.30	0.06-0.2	0.08-0.10	7.9-9.6	8-16	High------	0.37			
237*:												
Tisworth--------	0-2	20-25	1.15-1.25	0.6-2.0	0.10-0.12	7.4-9.0	0-4	Moderate	0.32	5	5	1-2
	2-60	25-35	1.20-1.30	0.2-0.6	0.08-0.10	8.5-9.6	0-4	Moderate	0.37			
Gerdrum Family--	0-2	14-18	1.25-1.35	2.0-6.0	0.10-0.12	6.6-8.4	0-2	Low-------	0.24	5	3	1-2
	2-36	35-45	1.20-1.30	0.00-0.06	0.12-0.15	8.5-9.6	0-4	High------	0.37			
	36-60	30-45	1.20-1.30	0.06-0.2	0.08-0.10	7.9-9.6	8-16	High------	0.37			
238*:												
Tule------------	0-3	18-25	1.20-1.30	0.6-2.0	0.14-0.17	6.6-7.8	0-2	Moderate	0.28	1	5	.5-1
	3-12	18-25	1.20-1.30	0.6-2.0	0.14-0.17	6.6-8.4	0-2	Moderate	0.32			
	12-15	18-25	1.30-1.40	0.6-2.0	0.03-0.05	6.6-8.4	0-4	Low-------	0.05			
	15	---	---	---	---	---	---	----------	----			
Chalkville------	0-2	10-20	1.20-1.30	0.6-2.0	0.14-0.17	6.6-7.8	0-0	Low-------	0.28	1	6	1-2
	2-12	25-35	1.20-1.30	0.6-2.0	0.18-0.20	6.6-7.8	0-0	Moderate	0.32			
	12-15	15-30	1.40-1.50	2.0-6.0	0.03-0.05	6.6-8.4	0-0	Moderate	0.05			
	15	---	---	---	---	---	---	----------	----			
239*:												
Tyzak-----------	0-4	10-15	1.30-1.40	2.0-6.0	0.12-0.14	7.9-8.4	0-2	Low-------	0.15	1	6	1-3
	4-13	15-25	1.20-1.30	0.6-2.0	0.07-0.10	7.9-8.4	0-4	Moderate	0.10			
	13	---	---	---	---	---	---	----------	----			
Rock outcrop.												
240--------------- Wycolo	0-3	5-15	1.30-1.45	0.6-2.0	0.12-0.14	7.4-8.4	<2	Low-------	0.28	2	3	1-2
	3-16	20-35	1.40-1.50	0.6-2.0	0.14-0.16	7.4-8.4	<2	Moderate	0.32			
	16-40	18-30	1.20-1.30	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.37			
	40	---	---	---	---	---	---	----------	----			
241*:												
Wycolo----------	0-6	5-15	1.30-1.45	0.6-2.0	0.12-0.14	7.4-8.4	<2	Low-------	0.28	2	3	1-2
	6-12	20-35	1.40-1.50	0.6-2.0	0.14-0.16	7.4-8.4	<2	Moderate	0.32			
	12-25	18-30	1.20-1.30	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.37			
	25-36	18-30	1.20-1.30	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.37			
	36	---	---	---	---	---	---	----------	----			
Alcova----------	0-4	15-18	1.25-1.35	2.0-6.0	0.10-0.12	7.4-8.4	0-2	Low-------	0.15	5	5	1-2
	4-24	20-25	1.25-1.35	0.6-2.0	0.11-0.12	7.4-8.4	0-2	Moderate	0.17			
	24-60	20-25	1.25-1.35	0.6-2.0	0.09-0.11	7.9-9.0	0-2	Low-------	0.10			
242*:												
Wycolo----------	0-6	5-15	1.30-1.45	0.6-2.0	0.12-0.14	7.4-8.4	<2	Low-------	0.28	2	3	1-2
	6-12	20-35	1.40-1.50	0.6-2.0	0.14-0.16	7.4-8.4	<2	Moderate	0.32			
	12-26	18-30	1.20-1.30	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.37			
	26-36	18-30	1.20-1.30	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.37			
	36	---	---	---	---	---	---	----------	----			

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
242*:												
Alcova----------	0-4	15-18	1.25-1.35	2.0-6.0	0.10-0.12	7.4-8.4	0-2	Low--------	0.15	5	5	1-2
	4-24	20-25	1.25-1.35	0.6-2.0	0.11-0.12	7.4-8.4	0-2	Moderate	0.17			
	24-60	20-25	1.25-1.35	0.6-2.0	0.09-0.11	7.9-9.0	0-2	Low--------	0.10			
Urban land.												
243*:												
Wycolo----------	0-2	5-15	1.30-1.45	0.6-2.0	0.12-0.14	7.4-8.4	<2	Low--------	0.28	2	3	1-2
	2-11	20-35	1.40-1.50	0.6-2.0	0.14-0.16	7.4-8.4	<2	Moderate	0.32			
	11-31	18-30	1.20-1.30	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.37			
	31	---	---	---	---	---	---	----------	----			
Tieside---------	0-1	5-15	1.25-1.35	2.0-6.0	0.12-0.14	7.4-8.4	0-2	Low--------	0.32	1	3	1-2
	1-6	5-15	1.35-1.45	2.0-6.0	0.10-0.15	7.9-8.4	0-2	Low--------	0.37			
	6-14	5-15	1.35-1.45	2.0-6.0	0.09-0.13	7.9-8.4	0-2	Low--------	0.24			
	14	---	---	---	---	---	---	----------	----			
244*:												
Wycolo----------	0-3	5-15	1.30-1.45	0.6-2.0	0.12-0.14	7.4-8.4	<2	Low--------	0.28	2	3	1-2
	3-13	20-35	1.40-1.50	0.6-2.0	0.14-0.16	7.4-8.4	<2	Moderate	0.32			
	13-24	18-30	1.20-1.30	0.6-2.0	0.14-0.16	7.9-8.4	<2	Moderate	0.37			
	24	---	---	---	---	---	---	----------	----			
Thermopolis-----	0-2	15-20	1.25-1.35	2.0-6.0	0.13-0.15	7.9-8.4	<4	Low--------	0.32	1	3	.5-1
	2-14	18-27	1.15-1.25	0.6-2.0	0.19-0.21	7.9-9.0	<4	Moderate	0.43			
	14	---	---	---	---	---	---	----------	----			
Rock outcrop.												

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months
					Ft		
100 Aberone	B	None	---	---	>6.0	---	---
101*:							
Abston	C	None	---	---	>6.0	---	---
Bullock	C	None	---	---	>6.0	---	---
102*:							
Alcova	B	None	---	---	>6.0	---	---
Borollic Camborthids.							
103*:							
Alcova, shallow substratum	B	None	---	---	>6.0	---	---
Lupinto	B	None	---	---	>6.0	---	---
Dahlquist	B	None	---	---	>6.0	---	---
104*:							
Alcova, calcareous subsoil	B	None	---	---	>6.0	---	---
Rock River	B	None	---	---	>6.0	---	---
105 Almy	B	None	---	---	>6.0	---	---
106*:							
Almy	B	None	---	---	>6.0	---	---
Urban land.							
107*:							
Almy	B	None	---	---	>6.0	---	---
Tismid	C	None	---	---	>6.0	---	---
108 Alogia	C	None	---	---	3.0-5.0	Apparent	Apr-Jul
109*:							
Alogia	C	None	---	---	3.0-5.0	Apparent	Apr-Jul
Urban land.							
110 Anchutz	B	None	---	---	>6.0	---	---
111*:							
Ansel	B	None	---	---	>6.0	---	---
Granile	B	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months
					Ft		
112*:							
Bateson	B	None	---	---	>6.0	---	---
Shirleybasin	B	None	---	---	>6.0	---	---
113*:							
Blackhall	D	None	---	---	>6.0	---	---
Browtine, moist	B	None	---	---	>6.0	---	---
114*:							
Blackhall	D	None	---	---	>6.0	---	---
Satanka	C	None	---	---	>6.0	---	---
Rock outcrop.							
115*:							
Blazon	D	None	---	---	>6.0	---	---
Chaperton	B	None	---	---	>6.0	---	---
116*:							
Blazon	D	None	---	---	>6.0	---	---
Delphill	C	None	---	---	>6.0	---	---
117*:							
Bonjea	D	None	---	---	>6.0	---	---
Chugcreek	C	None	---	---	>6.0	---	---
Rock outcrop.							
118*:							
Bonjea	D	None	---	---	>6.0	---	---
Rock outcrop.							
Chugcreek	C	None	---	---	>6.0	---	---
119 Bosler, wet substratum	C	None	---	---	1.5-3.0	Apparent	Apr-Sep
120*:							
Bosler	B	None	---	---	>6.0	---	---
Borollic Camborthids.							
121*:							
Bosler, wet substratum	C	None	---	---	1.5-3.0	Apparent	Apr-Sep
Urban land.							
122*:							
Boyle	D	None	---	---	>6.0	---	---
Alderon	B	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
122*:							
Cathedral	D	None	---	---	>6.0	---	---
123*:							
Boyle	D	None	---	---	>6.0	---	---
Boyle, thin solum	D	None	---	---	>6.0	---	---
124*:							
Boyle	D	None	---	---	>6.0	---	---
Rock outcrop.							
125*:							
Boyle	D	None	---	---	>6.0	---	---
Lininger	B	None	---	---	>6.0	---	---
126 Browtine	B	None	---	---	>6.0	---	---
127*:							
Browtine	B	None	---	---	>6.0	---	---
Hilltoppe	C	None	---	---	>6.0	---	---
128*:							
Bruja	B	None	---	---	>6.0	---	---
Canwall	C	None	---	---	>6.0	---	---
Telecan	B	None	---	---	>6.0	---	---
129*:							
Buffork	C	None	---	---	>6.0	---	---
Bucklon	D	None	---	---	>6.0	---	---
130*:							
Byrnie	D	None	---	---	>6.0	---	---
Rock outcrop.							
131. Calciborolls							
132 Canburn	D	Frequent	Brief	Apr-Jun	0.5-2.0	Apparent	Apr-Jul
133 Cantle	D	Frequent	Brief	Apr-Jul	0.5-2.0	Apparent	May-Jul
134*:							
Carbol	D	None	---	---	>6.0	---	---
Rock outcrop.							
135*:							
Carmody	B	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
135*:							
Edlin	B	None	---	---	>6.0	---	---
136*:							
Carmody	B	None	---	---	>6.0	---	---
Ryan Park	B	None	---	---	>6.0	---	---
137*:							
Cathedral	D	None	---	---	>6.0	---	---
Spinekop	B	None	---	---	>6.0	---	---
Rock outcrop.							
138 Center Creek	C	Rare	---	---	2.0-4.0	Apparent	Apr-Aug
139*:							
Chaperton, moderately saline	B	None	---	---	>6.0	---	---
Blazon	D	None	---	---	>6.0	---	---
140*:							
Chaperton	B	None	---	---	>6.0	---	---
Poposhia	B	None	---	---	>6.0	---	---
141*:							
Cheadle	D	None	---	---	>6.0	---	---
Passcreek, cobbly subsoil	C	None	---	---	>6.0	---	---
Rock outcrop.							
142*:							
Cheadle	D	None	---	---	>6.0	---	---
Rock outcrop.							
Miracle	B	None	---	---	>6.0	---	---
143. Cryaquolls							
144. Cryoborolls							
145*:							
Cushool	B	None	---	---	>6.0	---	---
Cutback	B	None	---	---	>6.0	---	---
146*:							
Cushool	B	None	---	---	>6.0	---	---
Diamondville	C	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months
					Ft		
147*:							
Cutback	B	None	---	---	>6.0	---	---
Pinelli	B	None	---	---	>6.0	---	---
148*:							
Dahlquist	B	None	---	---	>6.0	---	---
Rawlins	B	None	---	---	>6.0	---	---
Browtine	B	None	---	---	>6.0	---	---
149*:							
Dalecreek	C	Rare	---	---	2.5-4.0	Apparent	Apr-Jul
Kovich	D	Occasional	Brief	Apr-Jul	0-2.5	Apparent	Apr-Aug
150*:							
Delphill	C	None	---	---	>6.0	---	---
Blazon	D	None	---	---	>6.0	---	---
151*:							
Diamondville	C	None	---	---	>6.0	---	---
Cushool	B	None	---	---	>6.0	---	---
152*:							
Diamonkit	C	None	---	---	>6.0	---	---
Stylite	C	None	---	---	>6.0	---	---
153 Elkol	D	None	---	---	>6.0	---	---
154*:							
Elkol	D	None	---	---	>6.0	---	---
Gerdrum Family	D	None	---	---	>6.0	---	---
155*:							
Elkol	D	None	---	---	>6.0	---	---
Gerdrum Family	C	None	---	---	4.0-6.0	Apparent	May-Jul
156 Evanston	B	None	---	---	>6.0	---	---
157*:							
Evanston	B	None	---	---	>6.0	---	---
Bonjea	D	None	---	---	>6.0	---	---
158*:							
Fiveoh	B	None	---	---	>6.0	---	---
Fiveoh, cobbly substratum	B	None	---	---	>6.0	---	---
Ryan Park	B	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months
					Ft		
159*:							
Fiveoh, cobbly substratum	B	None	---	---	>6.0	---	---
Fiveoh	B	None	---	---	>6.0	---	---
Urban land.							
160*:							
Fiveoh, cobbly substratum	B	None	---	---	>6.0	---	---
Joemre	B	None	---	---	>6.0	---	---
161 Folavar	B	Rare	---	---	0-2.0	Apparent	Apr-Aug
162*:							
Folavar	B	None	---	---	0-2.0	Apparent	Apr-Aug
Borollic Camborthids.							
163 Forelle	B	None	---	---	>6.0	---	---
164*:							
Forelle	B	None	---	---	>6.0	---	---
Urban land.							
165*:							
Forelle	B	None	---	---	>6.0	---	---
Diamondville	C	None	---	---	>6.0	---	---
166*:							
Glendive	B	Rare	---	---	3.0-5.0	Apparent	Apr-Aug
Redrob	D	Rare	---	---	1.0-2.0	Apparent	Apr-Aug
Grenoble	D	Frequent	Brief	May-Jun	2.0-3.5	Apparent	Mar-Aug
167*:							
Grenoble	D	Frequent	Brief	May-Jun	2.0-3.5	Apparent	Mar-Aug
Gerrard	D	Frequent	Brief	May-Jun	0-1.5	Apparent	Mar-Aug
168 Greyback	B	None	---	---	>6.0	---	---
169 Gypla	C	None	---	---	1.5-3.5	Apparent	Apr-Jul
170*:							
Gypla	C	None	---	---	1.5-3.5	Apparent	Apr-Jul
Urban land.							
171*:							
Hanson	B	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
171*:							
Quander	B	None	---	---	>6.0	---	---
172*:							
Hapjack	D	None	---	---	>6.0	---	---
Rogert	D	None	---	---	>6.0	---	---
Amesmont	C	None	---	---	>6.0	---	---
173*:							
Ipson	B	None	---	---	>6.0	---	---
Evanston	B	None	---	---	>6.0	---	---
174, 175 Joemre	B	None	---	---	>6.0	---	---
176*:							
Kezar	B	None	---	---	>6.0	---	---
Carbol	D	None	---	---	>6.0	---	---
Rock outcrop.							
177*:							
Kildor	C	None	---	---	>6.0	---	---
Rock outcrop.							
178*:							
Kiltabar	C	Rare	---	---	2.0-4.0	Apparent	Mar-Sep
Tismid	C	None	---	---	>6.0	---	---
179*:							
Lakehelen	C	None	---	---	>6.0	---	---
Redfeather	D	None	---	---	>6.0	---	---
Amesmont	C	None	---	---	>6.0	---	---
180 Leavitt	B	None	---	---	>6.0	---	---
181*:							
Leavitt	D	None	---	---	>6.0	---	---
Granile	B	None	---	---	>6.0	---	---
182*:							
Leavitt	B	None	---	---	>6.0	---	---
Hanson	B	None	---	---	>6.0	---	---
183*:							
Leavitt	B	None	---	---	>6.0	---	---
Quander	B	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months
					Ft		
184 Luhon	B	None	---	---	>6.0	---	---
185*:							
Luvar	B	None	---	---	>6.0	---	---
Stylite	C	None	---	---	>6.0	---	---
Diamonkit	C	None	---	---	>6.0	---	---
186*:							
Lymanson loam	B	None	---	---	>6.0	---	---
Lymanson cobbly loam	B	None	---	---	>6.0	---	---
187 Manada	C	None	---	---	2.0-3.0	Apparent	Apr-Jul
188 McFadden	B	None	---	---	>6.0	---	---
189*:							
Miracle	B	None	---	---	>6.0	---	---
Cheadle	D	None	---	---	>6.0	---	---
190*:							
Moyerson	D	None	---	---	>6.0	---	---
Kemmerer	C	None	---	---	>6.0	---	---
191*:							
Nathale	C	None	---	---	>6.0	---	---
Passcreek, cobbly subsoil	C	None	---	---	>6.0	---	---
Rock outcrop.							
192 Pahlow	B	None	---	---	>6.0	---	---
193*:							
Pilotpeak	D	None	---	---	>6.0	---	---
Canwall	C	None	---	---	>6.0	---	---
194 Pinelli	B	None	---	---	>6.0	---	---
195*. Pits, mine							
196*:							
Poin	D	None	---	---	>6.0	---	---
Bowen	C	None	---	---	>6.0	---	---
Rock outcrop.							

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
197*:							
Poposhia	B	None	---	---	>6.0	---	---
Blazon	D	None	---	---	>6.0	---	---
198*:							
Poposhia	B	None	---	---	>6.0	---	---
Forelle	B	None	---	---	>6.0	---	---
199*:							
Poposhia	B	None	---	---	>6.0	---	---
Chaperton	B	None	---	---	>6.0	---	---
200*:							
Rainbolt	C	None	---	---	>6.0	---	---
Morset	B	None	---	---	>6.0	---	---
201*:							
Redfeather	D	None	---	---	>6.0	---	---
Lakehelen	C	None	---	---	>6.0	---	---
Rogert	D	None	---	---	>6.0	---	---
202 Redrob	D	Rare	---	---	1.0-2.0	Apparent	Mar-Aug
203*:							
Redrob, frequently flooded	D	Frequent	Brief	May-Jun	0-1.5	Apparent	Mar-Aug
Grenoble	D	Frequent	Brief	May-Jun	2.0-3.5	Apparent	Mar-Aug
Redrob	D	Rare	---	---	1.0-2.0	Apparent	Mar-Aug
204*:							
Redrob, frequently flooded	D	Frequent	Brief	May-Jun	0-1.5	Apparent	Mar-Aug
Redrob	D	Rare	---	---	1.0-2.0	Apparent	Mar-Aug
205*:							
Redrob, frequently flooded	D	Frequent	Brief	May-Jun	0-1.5	Apparent	Mar-Aug
Redrob	D	Rare	---	---	1.0-2.0	Apparent	Mar-Aug
Urban land.							
206*:							
Rentsac	C	None	---	---	>6.0	---	---
Wycolo	C	None	---	---	>6.0	---	---
207*:							
Renvers	D	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
207*:							
Chalkhill	C	None	---	---	>6.0	---	---
208*:							
Rimton	C	None	---	---	>6.0	---	---
Passcreek, cobbly subsoil	C	None	---	---	>6.0	---	---
Miracle	B	None	---	---	>6.0	---	---
209*. Riverwash							
210*:							
Rock outcrop.							
Bonjea	D	None	---	---	>6.0	---	---
211*:							
Rock outcrop.							
Bruja	B	None	---	---	>6.0	---	---
Byrnie	D	None	---	---	>6.0	---	---
212*:							
Rock outcrop.							
Cathedral	D	None	---	---	>6.0	---	---
213*:							
Rock outcrop.							
Cathedral	D	None	---	---	>6.0	---	---
Alderon	B	None	---	---	>6.0	---	---
214*:							
Rock outcrop.							
Pilotpeak	D	None	---	---	>6.0	---	---
215*:							
Rock outcrop.							
Rogert	D	None	---	---	>6.0	---	---
216, 217 Rock River	B	None	---	---	>6.0	---	---
218*:							
Rock River	B	None	---	---	>6.0	---	---
Urban land.							
219*:							
Rogert	D	None	---	---	>6.0	---	---
Lakehelen	C	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
219*:							
Rock outcrop.							
220*:							
Rogert	D	None	---	---	>6.0	---	---
Rock outcrop.							
Amesmont	C	None	---	---	>6.0	---	---
221 Rohonda	C	None	---	---	>6.0	---	---
222*:							
Rohonda	C	None	---	---	>6.0	---	---
Tieside	D	None	---	---	>6.0	---	---
223*:							
Rohonda	C	None	---	---	>6.0	---	---
Cheadle	D	None	---	---	>6.0	---	---
Rock outcrop.							
224 Ryark	A	None	---	---	>6.0	---	---
225*:							
Shirleybasin	B	None	---	---	>6.0	---	---
Twocabin	B	None	---	---	>6.0	---	---
Lahtida	C	None	---	---	>6.0	---	---
226 Silas	C	Rare	---	---	2.5-4.5	Apparent	Apr-Jul
227*:							
Silas, gravelly substratum	C	None	---	---	2.5-4.5	Apparent	Apr-Jul
Vensora	C	Rare	---	---	0.5-2.5	Apparent	Apr-Jul
228 Stunner	B	None	---	---	>6.0	---	---
229*:							
Stunner	B	None	---	---	>6.0	---	---
Borollic Camborthids.							
230*:							
Stunner	B	None	---	---	>6.0	---	---
Tisworth	C	None	---	---	>6.0	---	---
Blazon	D	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
231*:							
Stunner	B	None	---	---	>6.0	---	---
Urban land.							
232 Teeler	B	None	---	---	>6.0	---	---
233*:							
Thiel	B	None	---	---	>6.0	---	---
Lymanson	C	None	---	---	>6.0	---	---
Leavitt	B	None	---	---	>6.0	---	---
234*:							
Tieside	D	None	---	---	>6.0	---	---
Pilotpeak	D	None	---	---	>6.0	---	---
Rock outcrop.							
235 Tismid	C	None	---	---	>6.0	---	---
236*, 237*:							
Tisworth	C	None	---	---	>6.0	---	---
Gerdrum Family	D	None	---	---	>6.0	---	---
238*:							
Tule	C	None	---	---	>6.0	---	---
Chalkville	D	None	---	---	>6.0	---	---
239*:							
Tyzak	D	None	---	---	>6.0	---	---
Rock outcrop.							
240 Wycolo	B	None	---	---	>6.0	---	---
241*:							
Wycolo	B	None	---	---	>6.0	---	---
Alcova	B	None	---	---	>6.0	---	---
242*:							
Wycolo	B	None	---	---	>6.0	---	---
Alcova	B	None	---	---	>6.0	---	---
Urban land.							
243*:							
Wycolo	B	None	---	---	>6.0	---	---
Tieside	D	None	---	---	>6.0	---	---

See footnote at end of table.

TABLE 17.--WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Depth	Kind	Months
					Ft		
244*:							
Wycolo	B	None	---	---	>6.0	---	---
Thermopolis	D	None	---	---	>6.0	---	---
Rock outcrop.							

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--SOIL FEATURES

(The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
100 Aberone	>60	---	---	---	Low	High	Low.
101*:							
Abston	20-40	Soft	---	---	Moderate	High	Moderate.
Bullock	20-40	Soft	---	---	Moderate	High	High.
102*:							
Alcova	>60	---	---	---	Moderate	High	Low.
Borollic Camborthids.							
103*:							
Alcova, shallow substratum	>60	---	---	---	Moderate	High	Low.
Lupinto	>60	---	---	---	Low	High	Low.
Dahlquist	>60	---	---	---	Moderate	High	Low.
104*:							
Alcova, calcareous subsoil	>60	---	---	---	Moderate	High	Low.
Rock River	>60	---	---	---	Moderate	High	Low.
105 Almy	>60	---	---	---	Moderate	High	Low.
106*:							
Almy	>60	---	---	---	Moderate	High	Low.
Urban land.							
107*:							
Almy	>60	---	---	---	Moderate	High	Low.
Tismid	>60	---	---	---	Moderate	High	High.
108 Alogia	>60	---	---	---	Moderate	High	High.
109*:							
Alogia	>60	---	---	---	Moderate	High	High.
Urban land.							
110 Anchutz	>60	---	---	---	Moderate	High	High.
111*:							
Ansel	>60	---	---	---	Moderate	Low	Low.
Granile	>60	---	---	---	Moderate	Low	Low.

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
112*:							
Bateson	>60	---	---	---	Low	High	Low.
Shirleybasin	>60	---	---	---	Moderate	High	Low.
113*:							
Blackhall	10-20	Soft	---	---	Low	High	Moderate.
Browtine, moist	>60	---	---	---	Moderate	High	Low.
114*:							
Blackhall	10-20	Soft	---	---	Low	High	Moderate.
Satanka	20-40	Soft	---	---	Low	High	Low.
Rock outcrop.							
115*:							
Blazon	10-20	Soft	---	---	Low	High	Moderate.
Chaperton	20-40	Soft	---	---	Moderate	High	Low.
116*:							
Blazon	10-20	Soft	---	---	Low	High	Moderate.
Delphill	20-40	Soft	---	---	Moderate	High	Moderate.
117*:							
Bonjea	10-20	Hard	---	---	Moderate	Moderate	Low.
Chugcreek	20-40	Hard	---	---	Low	Moderate	Low.
Rock outcrop.							
118*:							
Bonjea	10-20	Hard	---	---	Moderate	Moderate	Low.
Rock outcrop.							
Chugcreek	20-40	Hard	---	---	Low	Moderate	Low.
119 Bosler, wet substratum	>60	---	---	---	Moderate	High	Low.
120*:							
Bosler	>60	---	---	---	Low	High	Low.
Borollic Camborthids.							
121*:							
Bosler, wet substratum	>60	---	---	---	Moderate	High	Low.
Urban land.							
122*:							
Boyle	10-20	Soft	---	---	Moderate	Low	Low.
Alderon	20-40	Soft	---	---	Moderate	Moderate	Low.

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock Depth	Bedrock Hardness	Cemented pan Depth	Cemented pan Hardness	Potential frost action	Risk of corrosion Uncoated steel	Risk of corrosion Concrete
	In		In				
122*:							
Cathedral	10-20	Hard	---	---	Moderate	Moderate	Low.
123*:							
Boyle	10-20	Soft	---	---	Moderate	Low	Low.
Boyle, thin solum	7-10	Soft	---	---	Moderate	Low	Low.
124*:							
Boyle	10-20	Soft	---	---	Moderate	Low	Low.
Rock outcrop.							
125*:							
Boyle	10-20	Soft	---	---	Moderate	Low	Low.
Lininger	20-40	Soft	---	---	Low	Moderate	Low.
126 Browtine	>60	---	---	---	Low	High	Low.
127*:							
Browtine	>60	---	---	---	Low	High	Low.
Hilltoppe	>60	---	10-20	Thin	Low	High	Low.
128*:							
Bruja	20-40	Soft	---	---	Moderate	High	Low.
Canwall	20-40	Hard	---	---	Low	High	Low.
Telecan	>60	---	---	---	Moderate	High	Low.
129*:							
Buffork	20-40	Soft	---	---	Moderate	Moderate	Low.
Bucklon	10-20	Soft	---	---	Low	Moderate	Low.
130*:							
Byrnie	10-20	Soft	---	---	Low	Moderate	Low.
Rock outcrop.							
131. Calciborolls							
132 Canburn	>60	---	---	---	Moderate	High	Low.
133 Cantle	>60	---	---	---	High	High	High.
134*:							
Carbol	10-20	Hard	---	---	Moderate	Low	Low.
Rock outcrop.							
135*:							
Carmody	20-40	Soft	---	---	Moderate	High	Low.

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
135*:							
Edlin	>60	---	---	---	Moderate	High	Low.
136*:							
Carmody	20-40	Soft	---	---	Moderate	High	Low.
Ryan Park	>60	---	---	---	Moderate	High	Low.
137*:							
Cathedral	10-20	Hard	---	---	Moderate	Moderate	Low.
Spinekop	>60	---	---	---	Moderate	High	Low.
Rock outcrop.							
138 Center Creek	>60	---	---	---	Moderate	High	Low.
139*:							
Chaperton, moderately saline	20-40	Soft	---	---	Moderate	High	High.
Blazon	10-20	Soft	---	---	Low	High	Moderate.
140*:							
Chaperton	20-40	Soft	---	---	Moderate	High	Low.
Poposhia	>60	---	---	---	Moderate	High	Low.
141*:							
Cheadle	10-20	Hard	---	---	Low	Moderate	Low.
Passcreek, cobbly subsoil	20-40	Hard	---	---	Moderate	High	Low.
Rock outcrop.							
142*:							
Cheadle	10-20	Hard	---	---	Low	Moderate	Low.
Rock outcrop.							
Miracle	20-40	Hard	---	---	Moderate	Moderate	Low.
143. Cryaquolls							
144. Cryoborolls							
145*:							
Cushool	20-40	Soft	---	---	Moderate	High	Low.
Cutback	20-40	Soft	---	---	Low	High	Moderate.
146*:							
Cushool	20-40	Soft	---	---	Moderate	High	Low.
Diamondville	20-40	Soft	---	---	Moderate	High	Low.

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
147*:							
Cutback	20-40	Soft	---	---	Low	High	Low.
Pinelli	>60	---	---	---	Low	High	Low.
148*:							
Dahlquist	>60	---	---	---	Moderate	High	Low.
Rawlins	>60	---	---	---	Low	High	Low.
Browtine	>60	---	---	---	Moderate	High	Low.
149*:							
Dalecreek	>60	---	---	---	Moderate	High	Low.
Kovich	>60	---	---	---	High	High	Low.
150*:							
Delphill	20-40	Soft	---	---	Moderate	High	Moderate.
Blazon	10-20	Soft	---	---	Low	High	Moderate.
151*:							
Diamondville	20-40	Soft	---	---	Moderate	High	Low.
Cushool	20-40	Soft	---	---	Moderate	High	Low.
152*:							
Diamonkit	20-40	Soft	---	---	Low	High	High.
Stylite	>60	---	---	---	Low	High	High.
153 Elkol	>60	---	---	---	Low	High	High.
154*, 155*:							
Elkol	>60	---	---	---	Low	High	High.
Gerdrum Family	>60	---	---	---	Low	High	High.
156 Evanston	>60	---	---	---	Moderate	High	Low.
157*:							
Evanston	>60	---	---	---	Moderate	High	Low.
Bonjea	10-20	Hard	---	---	Moderate	Moderate	Low.
158*:							
Fiveoh	>60	---	---	---	Low	High	Low.
Fiveoh, cobbly substratum	>60	---	---	---	Low	High	Low.
Ryan Park	>60	---	---	---	Moderate	High	Low.
159*:							
Fiveoh, cobbly substratum	>60	---	---	---	Low	High	Low.

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
159*:							
Fiveoh	>60	---	---	---	Low	High	Low.
Urban land.							
160*:							
Fiveoh, cobbly substratum	>60	---	---	---	Low	High	Low.
Joemre	>60	---	---	---	Low	High	Low.
161 Folavar	>60	---	---	---	Low	High	Low.
162*:							
Folavar	>60	---	---	---	Low	High	Low.
Borollic Camborthids.							
163 Forelle	>60	---	---	---	Moderate	High	Low.
164*:							
Forelle	>60	---	---	---	Moderate	High	Low.
Urban land.							
165*:							
Forelle	>60	---	---	---	Moderate	High	Low.
Diamondville	20-40	Soft	---	---	Moderate	High	Low.
166*:							
Glendive	>60	---	---	---	Moderate	High	Moderate.
Redrob	>60	---	---	---	Low	High	High.
Grenoble	>60	---	---	---	Moderate	High	Low.
167*:							
Grenoble	>60	---	---	---	Moderate	High	Low.
Gerrard	>60	---	---	---	Low	High	Low.
168 Greyback	>60	---	---	---	Moderate	High	Low.
169 Gypla	>60	---	---	---	High	High	High.
170*:							
Gypla	>60	---	---	---	High	High	High.
Urban land.							
171*:							
Hanson	>60	---	---	---	Moderate	High	Low.
Quander	>60	---	---	---	Moderate	Moderate	Low.

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock: Depth	Bedrock: Hardness	Cemented pan: Depth	Cemented pan: Hardness	Potential frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
	In		In				
172*:							
Hapjack	10-20	Hard	---	---	Low	Moderate	Low.
Rogert	10-20	Hard	---	---	Moderate	Moderate	Low.
Amesmont	20-40	Soft	---	---	Low	Moderate	Low.
173*:							
Ipson	>60	---	---	---	Moderate	Low	Low.
Evanston	>60	---	---	---	Moderate	High	Low.
174, 175 Joemre	>60	---	---	---	Low	High	Low.
176*:							
Kezar	20-40	Hard	---	---	Moderate	Low	Low.
Carbol	10-20	Hard	---	---	Moderate	Low	Low.
Rock outcrop.							
177*:							
Kildor	20-40	Soft	---	---	Moderate	High	Low.
Rock outcrop.							
178*:							
Kiltabar	>60	---	---	---	Moderate	High	High.
Tismid	>60	---	---	---	Moderate	High	High.
179*:							
Lakehelen	20-40	Hard	---	---	Moderate	Moderate	Low.
Redfeather	10-20	Hard	---	---	Moderate	Moderate	Low.
Amesmont	20-40	Soft	---	---	Low	Moderate	Low.
180 Leavitt	>60	---	---	---	Moderate	High	Low.
181*:							
Leavitt	>60	---	---	---	Moderate	High	Low.
Granile	>60	---	---	---	Moderate	Low	Low.
182*:							
Leavitt	>60	---	---	---	Moderate	High	Low.
Hanson	>60	---	---	---	Moderate	High	Low.
183*:							
Leavitt	>60	---	---	---	Moderate	High	Low.
Quander	>60	---	---	---	Moderate	Moderate	Low.
184 Luhon	>60	---	---	---	Moderate	High	Low.

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
185*:							
Luvar	>60	---	---	---	Low	High	High.
Stylite	>60	---	---	---	Low	High	High.
Diamonkit	20-40	Soft	---	---	Low	High	High.
186*:							
Lymanson loam	20-40	Soft	---	---	Moderate	High	Low.
Lymanson cobbly loam	20-40	Soft	---	---	Moderate	High	Low.
187 Manada	>60	---	---	---	Low	High	Moderate.
188 McFadden	>60	---	---	---	Low	High	Low.
189*:							
Miracle	20-40	Hard	---	---	Moderate	Moderate	Low.
Cheadle	10-20	Hard	---	---	Low	Moderate	Low.
190*:							
Moyerson	10-20	Soft	---	---	Low	High	Low.
Kemmerer	20-40	Soft	---	---	High	High	Moderate.
191*:							
Nathale	20-40	Hard	---	---	Moderate	High	Low.
Passcreek, cobbly subsoil	20-40	Hard	---	---	Moderate	High	Low.
Rock outcrop.							
192 Pahlow	>60	---	---	---	Low	Moderate	Low.
193*:							
Pilotpeak	7-20	Hard	---	---	Low	High	Low.
Canwall	20-40	Hard	---	---	Low	High	Low.
194 Pinelli	>60	---	---	---	Low	High	Low.
195*. Pits, mine							
196*:							
Poin	10-20	Hard	---	---	Low	High	Low.
Bowen	20-40	Hard	---	---	Moderate	Moderate	Low.
Rock outcrop.							
197*:							
Poposhia	>60	---	---	---	Moderate	High	Low.

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
197*:							
Blazon	10-20	Soft	---	---	Low	High	Moderate.
198*:							
Poposhia	>60	---	---	---	Moderate	High	Low.
Forelle	>60	---	---	---	Moderate	High	Low.
199*:							
Poposhia	>60	---	---	---	Moderate	High	Low.
Chaperton	20-40	Soft	---	---	Moderate	High	Low.
200*:							
Rainbolt	20-40	Soft	---	---	Low	High	Low.
Morset	>60	---	---	---	Moderate	High	Low.
201*:							
Redfeather	10-20	Hard	---	---	Moderate	Moderate	Low.
Lakehelen	20-40	Hard	---	---	Moderate	Moderate	Low.
Rogert	10-20	Hard	---	---	Moderate	Moderate	Low.
202 Redrob	>60	---	---	---	Low	High	High.
203*:							
Redrob, frequently flooded	>60	---	---	---	Low	High	High.
Grenoble	>60	---	---	---	Moderate	High	Low.
Redrob	>60	---	---	---	Low	High	High.
204*:							
Redrob, frequently flooded	>60	---	---	---	Low	High	High.
Redrob	>60	---	---	---	Low	High	High.
205*:							
Redrob, frequently flooded	>60	---	---	---	Low	High	High.
Redrob	>60	---	---	---	Low	High	High.
Urban land.							
206*:							
Rentsac	10-20	Hard	---	---	Low	Moderate	Low.
Wycolo	20-40	Soft	---	---	Low	High	Low.
207*:							
Renvers	4-10	Hard	---	---	Low	Low	Low.
Chalkhill	10-20	Hard	---	---	Moderate	Low	Low.

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
208*:							
Rimton	20-40	Soft	---	---	Moderate	Moderate	Low.
Passcreek, cobbly subsoil	20-40	Hard	---	---	Moderate	High	Low.
Miracle	20-40	Hard	---	---	Moderate	Moderate	Low.
209*. Riverwash							
210*:							
Rock outcrop.							
Bonjea	10-20	Hard	---	---	Moderate	Moderate	Low.
211*:							
Rock outcrop.							
Bruja	20-40	Soft	---	---	Moderate	High	Low.
Byrnie	10-20	Soft	---	---	Low	Moderate	Low.
212*:							
Rock outcrop.							
Cathedral	10-20	Hard	---	---	Moderate	Moderate	Low.
213*:							
Rock outcrop.							
Cathedral	10-20	Hard	---	---	Moderate	Moderate	Low.
Alderon	20-40	Soft	---	---	Moderate	Moderate	Low.
214*:							
Rock outcrop.							
Pilotpeak	7-20	Hard	---	---	Low	High	Low.
215*:							
Rock outcrop.							
Rogert	10-20	Hard	---	---	Moderate	Moderate	Low.
216, 217 Rock River	>60	---	---	---	Moderate	High	Low.
218*:							
Rock River	>60	---	---	---	Moderate	High	Low.
Urban land.							
219*:							
Rogert	10-20	Hard	---	---	Moderate	Moderate	Low.
Lakehelen	20-40	Hard	---	---	Moderate	Moderate	Low.
Rock outcrop.							

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
220*:							
Rogert	10-20	Hard	---	---	Moderate	Moderate	Low.
Rock outcrop.							
Amesmont	20-40	Soft	---	---	Low	Moderate	Low.
221 Rohonda	20-40	Soft	---	---	Moderate	High	Low.
222*:							
Rohonda	20-40	Soft	---	---	Moderate	High	Low.
Tieside	10-20	Soft	---	---	Low	High	Moderate.
223*:							
Rohonda	20-40	Soft	---	---	Moderate	High	Low.
Cheadle	10-20	Hard	---	---	Low	Moderate	Low.
Rock outcrop.							
224 Ryark	>60	---	---	---	Low	High	Low.
225*:							
Shirleybasin	>60	---	---	---	Moderate	High	Low.
Twocabin	>60	---	---	---	Moderate	High	Low.
Lahtida	20-40	Soft	---	---	Moderate	High	Low.
226 Silas	>60	---	---	---	Moderate	High	Low.
227*:							
Silas, gravelly substratum	>60	---	---	---	Moderate	High	Low.
Vensora	>60	---	---	---	High	High	Low.
228 Stunner	>60	---	---	---	Low	High	Low.
229*:							
Stunner	>60	---	---	---	Low	High	Low.
Borollic Camborthids.							
230*:							
Stunner	>60	---	---	---	Low	High	Low.
Tisworth	>60	---	---	---	Moderate	High	High.
Blazon	8-20	Soft	---	---	Low	High	Moderate.
231*:							
Stunner	>60	---	---	---	Low	High	Low.
Urban land.							

See footnote at end of table.

TABLE 18.--SOIL FEATURES--Continued

Soil name and map symbol	Bedrock		Cemented pan		Potential frost action	Risk of corrosion	
	Depth	Hardness	Depth	Hardness		Uncoated steel	Concrete
	In		In				
232 Teeler	>60	---	---	---	Low	High	Low.
233*:							
Thiel	>60	---	---	---	Moderate	High	Low.
Lymanson	20-40	Soft	---	---	Moderate	High	Low.
Leavitt	>60	---	---	---	Moderate	High	Low.
234*:							
Tieside	10-20	Soft	---	---	Low	High	Moderate.
Pilotpeak	7-20	Hard	---	---	Low	High	Low.
Rock outcrop.							
235 Tismid	>60	---	---	---	Moderate	High	High.
236*, 237*:							
Tisworth	>60	---	---	---	Moderate	High	High.
Gerdrum Family	>60	---	---	---	Low	High	High.
238*:							
Tule	4-20	Hard	---	---	Low	Moderate	Low.
Chalkville	9-20	Hard	---	---	High	High	Low.
239*:							
Tyzak	6-20	Hard	---	---	Moderate	High	Low.
Rock outcrop.							
240 Wycolo	20-40	Soft	---	---	Moderate	High	Low.
241*:							
Wycolo	20-40	Soft	---	---	Moderate	High	Low.
Alcova	>60	---	---	---	Moderate	High	Low.
242*:							
Wycolo	20-40	Soft	---	---	Moderate	High	Low.
Alcova	>60	---	---	---	Moderate	High	Low.
Urban land.							
243*:							
Wycolo	20-40	Soft	---	---	Moderate	High	Low.
Tieside	10-20	Soft	---	---	Low	High	Moderate.
244*:							
Wycolo	20-40	Soft	---	---	Moderate	High	Low.
Thermopolis	10-20	Soft	---	---	Low	High	Moderate.
Rock outcrop.							

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 19.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Aberone	Loamy-skeletal, carbonatic, mesic Aridic Haplustolls
Abston	Fine, montmorillonitic Borollic Natrargids
Alcova	Fine-loamy, mixed Borollic Haplargids
Alderon	Fine-loamy, mixed Typic Eutroboralfs
Almy	Fine-loamy, mixed Borollic Haplargids
Alogia	Fine-loamy, mixed Borollic Haplargids
Amesmont	Fine-loamy, mixed Mollic Cryoboralfs
Anchutz	Fine-loamy, mixed Borollic Haplargids
Ansel	Fine-loamy, mixed Typic Cryoboralfs
Bateson	Fine-loamy, mixed Borollic Haplargids
Blackhall	Loamy, mixed (calcareous), frigid, shallow Ustic Torriorthents
Blazon	Loamy, mixed (calcareous), frigid, shallow Ustic Torriorthents
Bonjea	Loamy, mixed Lithic Argiborolls
Bosler	Fine-loamy over sandy or sandy-skeletal, mixed Borollic Haplargids
Bowen	Loamy-skeletal, mixed Argic Cryoborolls
Boyle	Loamy-skeletal, mixed, shallow Aridic Argiborolls
Browtine	Loamy-skeletal, mixed Borollic Calciorthids
Bruja	Loamy-skeletal, mixed Borollic Calciorthids
Bucklon	Loamy, mixed, shallow Typic Cryoborolls
Buffork	Fine-loamy, mixed Argic Cryoborolls
Bullock	Fine-loamy, mixed Borollic Natrargids
Byrnie	Loamy, mixed (calcareous), frigid, shallow Ustic Torriorthents
Canburn	Fine-loamy, mixed (calcareous), frigid Cumulic Haplaquolls
Cantle	Fine-loamy, mixed (calcareous), frigid Cumulic Endoaquolls
Canwall	Coarse-loamy, mixed Borollic Haplargids
Carbol	Loamy, mixed Argic Lithic Cryoborolls
Carmody	Coarse-loamy, mixed (calcareous), frigid Ustic Torriorthents
Cathedral	Loamy-skeletal, mixed Lithic Haploborolls
Center Creek	Fine-loamy, mixed Pachic Argiborolls
Chalkhill	Loamy, mixed Borollic Lithic Haplargids
Chalkville	Loamy, mixed Borollic Lithic Haplargids
Chaperton	Fine-loamy, mixed Borollic Camborthids
Cheadle	Loamy-skeletal, mixed Lithic Cryoborolls
Chugcreek	Fine-loamy, mixed Pachic Argiborolls
Cushool	Fine-loamy, mixed Borollic Haplargids
Cutback	Fine-loamy, mixed Borollic Haplargids
Dahlquist	Loamy-skeletal, mixed Borollic Haplargids
Dalecreek	Fine-loamy, mixed Cumulic Haploborolls
Delphill	Fine-loamy, mixed (calcareous), frigid Ustic Torriorthents
Diamondville	Fine-loamy, mixed Borollic Haplargids
Diamonkit	Fine-loamy, mixed Borollic Haplargids
Edlin	Coarse-loamy, mixed Borollic Camborthids
Elkol	Fine, montmorillonitic (calcareous), frigid Ustertic Torriorthents
Evanston	Fine-loamy, mixed Aridic Argiborolls
Fiveoh	Coarse-loamy, mixed Borollic Calciorthids
Folavar	Sandy-skeletal, mixed Borollic Camborthids
Forelle	Fine-loamy, mixed Borollic Haplargids
Gerdrum Family	Fine, montmorillonitic Borollic Natrargids
Gerrard	Fine-loamy over sandy or sandy-skeletal, mixed, frigid Typic Haplaquolls
Glendive	Coarse-loamy, mixed (calcareous), frigid Ustic Torrifluvents
Granile	Loamy-skeletal, mixed Typic Cryoboralfs
Grenoble	Sandy-skeletal, mixed, frigid Aquic Torriorthents
Greyback	Loamy-skeletal, mixed Typic Cryoborolls
Gypla	Coarse-silty, gypsic, frigid Typic Gypsiorthids
Hanson	Loamy-skeletal, carbonatic Calcic Cryoborolls
Hapjack	Loamy-skeletal, mixed Lithic Mollic Cryoboralfs
Hilltoppe	Loamy-skeletal, carbonatic, shallow Borollic Paleorthids
Ipson	Loamy-skeletal, mixed Aridic Argiborolls
Joemre	Coarse-loamy, mixed Borollic Haplargids
Kemmerer	Fine, montmorillonitic Borollic Camborthids

TABLE 19.--CLASSIFICATION OF THE SOILS--Continued

Soil name	Family or higher taxonomic class
Kezar	Fine-loamy, mixed Argic Cryoborolls
Kildor	Fine, montmorillonitic Typic Cryoborolls
Kiltabar	Fine-loamy, mixed, frigid Typic Salorthids
Kovich	Fine-loamy, mixed, frigid Cumulic Haplaquolls
Lahtida	Fine, mixed Borollic Haplargids
Lakehelen	Loamy-skeletal, mixed Typic Cryoboralfs
Leavitt	Fine-loamy, mixed Argic Cryoborolls
Lininger	Fine-loamy, mixed Typic Argiborolls
Luhon	Fine-loamy, mixed Borollic Calciorthids
Lupinto	Loamy-skeletal, mixed Borollic Haplargids
Luvar	Fine-loamy, mixed, frigid Calcic Gypsiorthids
Lymanson	Fine-loamy, mixed Argic Cryoborolls
Manada	Coarse-loamy, mixed Aquic Calciborolls
McFadden	Coarse-loamy, mixed Borollic Calciorthids
Miracle	Fine-loamy, mixed Argic Cryoborolls
Morset	Fine-loamy, mixed Argic Cryoborolls
Moyerson	Clayey, montmorillonitic (calcareous), frigid, shallow Ustic Torriorthents
Nathale	Loamy-skeletal, mixed Argic Cryoborolls
Pahlow	Sandy-skeletal, mixed Borollic Camborthids
Passcreek	Fine-loamy, mixed Argic Cryoborolls
Pilotpeak	Loamy-skeletal, mixed Borollic Lithic Calciorthids
Pinelli	Fine, montmorillonitic Borollic Haplargids
Poin	Loamy-skeletal, mixed Lithic Cryoborolls
Poposhia	Fine-loamy, mixed (calcareous), frigid Ustic Torriorthents
Quander	Loamy-skeletal, mixed Argic Cryoborolls
Rainbolt	Fine-loamy, mixed Argic Cryoborolls
Rawlins	Coarse-loamy, mixed Borollic Haplargids
Redfeather	Loamy-skeletal, mixed Lithic Cryoboralfs
Redrob	Fine-loamy over sandy or sandy-skeletal, mixed (calcareous), frigid Fluvaquentic Haplaquolls
*Rentsac	Loamy-skeletal, mixed, (calcareous), frigid Lithic Ustic Torriorthents
Renvers	Loamy-skeletal, mixed, nonacid, frigid Lithic Ustic Torriorthents
Rimton	Fine-loamy, mixed Mollic Cryoboralfs
Rock River	Fine-loamy, mixed Borollic Haplargids
Rogert	Loamy-skeletal, mixed Lithic Cryoborolls
Rohonda	Coarse-loamy, mixed Borollic Haplargids
Ryan Park	Coarse-loamy, mixed Borollic Haplargids
Ryark	Coarse-loamy, mixed Borollic Haplargids
Satanka	Fine-loamy, mixed Borollic Haplargids
Shirleybasin	Fine, mixed Borollic Haplargids
Silas	Fine-loamy, mixed Cumulic Cryoborolls
Spinekop	Fine-loamy, mixed, frigid Borollic Camborthids
Stunner	Fine-loamy, mixed Borollic Haplargids
Stylite	Fine-loamy, mixed Borollic Haplargids
Teeler	Loamy-skeletal, mixed Argic Cryoborolls
Telecan	Coarse-loamy, mixed Cumulic Haploborolls
Thermopolis	Loamy, mixed (calcareous), frigid, shallow Ustic Torriorthents
Thiel	Loamy-skeletal, mixed Argic Cryoborolls
Tieside	Loamy, mixed, shallow Borollic Calciorthids
Tismid	Fine-loamy, mixed Borollic Natrargids
Tisworth	Fine-loamy, mixed Borollic Natrargids
Tule	Loamy-skeletal, mixed, nonacid, frigid Lithic Ustic Torriorthents
Twocabin	Loamy-skeletal, mixed Borollic Haplargids
Tyzak	Loamy-skeletal, mixed Lithic Calciborolls
Vensora	Fine-loamy, mixed Typic Cryaquolls
Wycolo	Fine-loamy, mixed Borollic Haplargids

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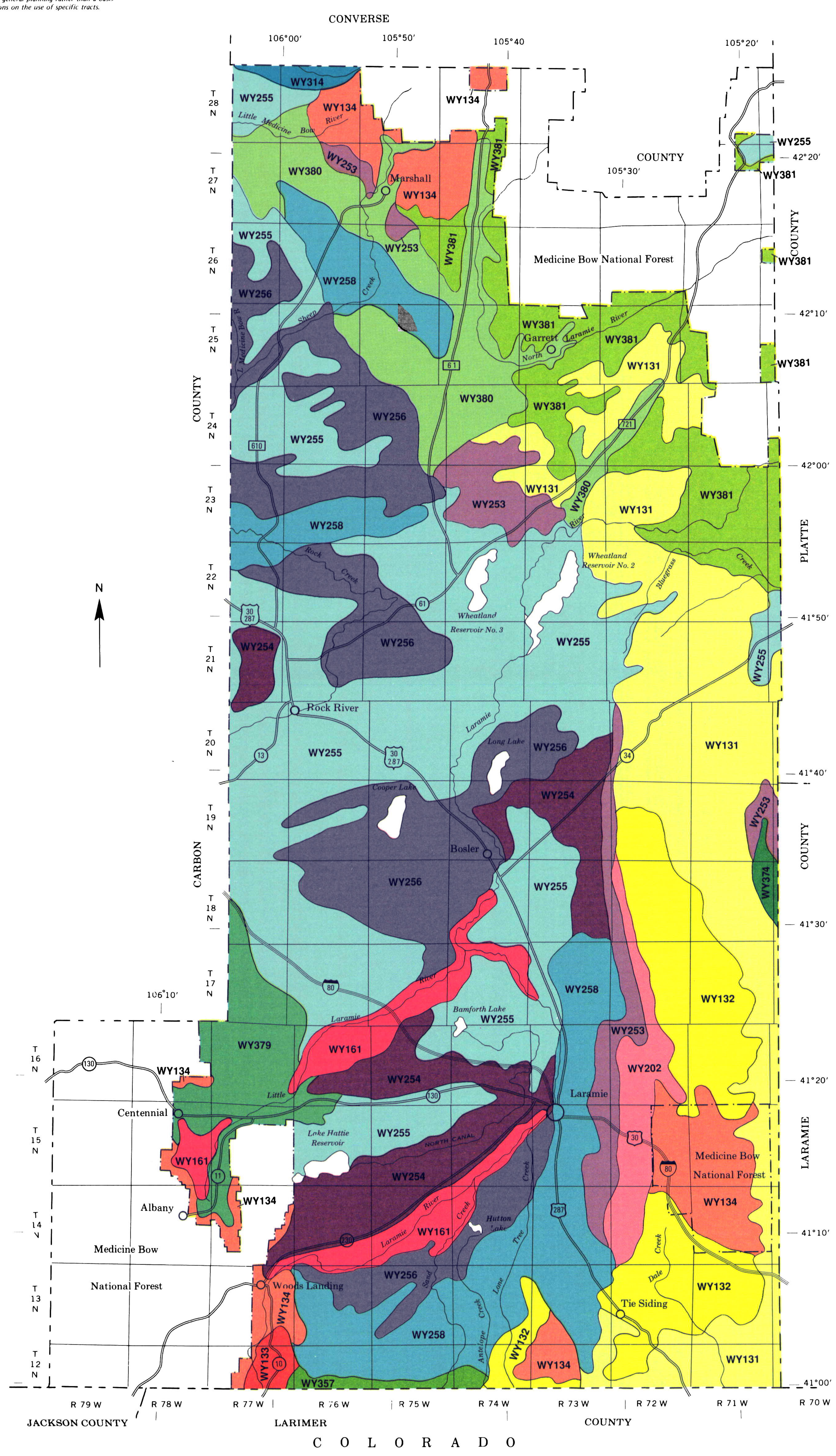
Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



SOIL LEGEND*

WY131	BOYLE-LININGER-ROCK OUTCROP
WY132	ROGERT-ROCK OUTCROP
WY133	LYMANSON-THIEL
WY134	ROGERT-ROCK OUTCROP-LAKEHELEN
WY161	REDROB-GRENOBLE
WY202	CHEADLE-NATHALE-ROCK OUTCROP
WY253	PILOTPEAK-CANWALL-ROCK OUTCROP
WY254	BOROLLIC CAMBORTHIDS-PAHLOW-ALCOVA
WY255	FORELLE-POPOSHIA-DIAMONDVILLE
WY256	GERDRUM FAMILY-TISWORTH-ELKOL
WY258	WYCOLO-TIESIDE-FIVEOH
WY314	BATESON-FORELLE
WY357	MIRACLE-CHEADLE-ROCK OUTCROP
WY374	POPOSHIA-BLAZON-IPSON
WY379	BROWTINE-LYMANSON-DAHLQUIST
WY380	CUTBACK-SHIRLEYBASIN-TWOCABIN
WY381	ROCK OUTCROP-CATHEDRAL-ALDERON

*The units on this legend are described in the text under the heading "General Soil Map Units."

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE AND FOREST SERVICE
UNIVERSITY OF WYOMING AGRICULTURAL EXPERIMENT STATION
BUREAU OF LAND MANAGEMENT

GENERAL SOIL MAP

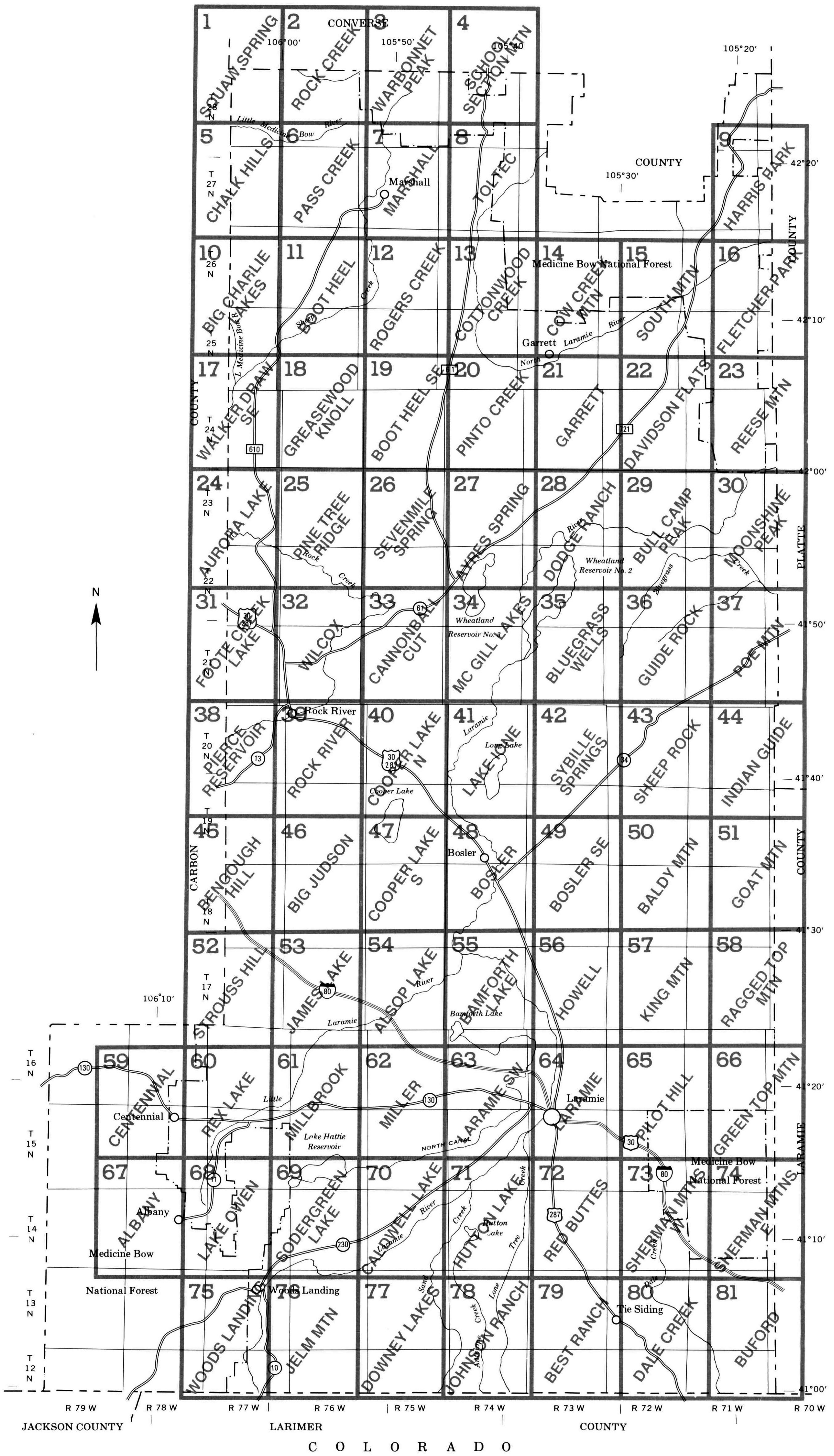
ALBANY COUNTY AREA, WYOMING

Scale 1:443,520

1 0 1 2 3 4 5 6 7 Miles

0 7 14 Km

Compiled 1988



SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS

ALBANY COUNTY AREA, WYOMING

Scale 1:443,520

1 0 1 2 3 4 5 6 7 Miles

0 7 14 Km

SOIL LEGEND

SYMBOL	NAME
100	Aberone gravelly sandy loam, 0 to 15 percent slopes
101	Abston-Bullock complex, 5 to 25 percent slopes
102	Alcova-Borollic Camborthids complex, 0 to 8 percent slopes
103	Alcova, shallow substratum-Lupinto-Dahlquist complex, 0 to 8 percent slopes
104	Alcova, calcareous subsoil-Rock River complex, 0 to 8 percent slopes
105	Almy loam, 0 to 8 percent slopes
106	Almy-Urban Land complex, 0 to 3 percent slopes
107	Almy-Tismid association, 0 to 8 percent slopes
108	Alogia loam, 0 to 3 percent slopes
109	Alogia-Urban Land complex, 0 to 3 percent slopes
110	Anchutz sandy loam, 1 to 8 percent slopes
111	Ansel-Granile gravelly sandy loams, 6 to 45 percent slopes
112	Bateson-Shirleybasin association, 1 to 15 percent slopes
113	Blackhall-Browtine, moist, complex, 15 to 45 percent slopes
114	Blackhall-Satanka-Rock outcrop complex, 5 to 20 percent slopes
115	Blazon-Chaperton complex, moist, 3 to 20 percent slopes
116	Blazon-Delphill complex, 20 to 45 percent slopes
117	Bonjea-Chugcreek-Rock outcrop complex, 3 to 15 percent slopes
118	Bonjea-Rock outcrop-Chugcreek complex, 15 to 40 percent slopes
119	Bosler fine sandy loam, wet substratum, 0 to 3 percent slopes
120	Bosler-Borollic Camborthids complex, 0 to 8 percent slopes
121	Bosler, wet substratum-Urban Land complex, 0 to 3 percent slopes
122	Boyle-Alderon-Cathedral gravelly sandy loams, 5 to 25 percent slopes
123	Boyle-Boyle, thin solum, gravelly sandy loams, 3 to 6 percent slopes
124	Boyle-Rock outcrop complex, 5 to 25 percent slopes
125	Boyle-Lininger association, 1 to 15 percent slopes
126	Browtine very gravelly fine sandy loam, 0 to 8 percent slopes
127	Browtine-Hilltoppe very gravelly sandy loams, 0 to 8 percent slopes
128	Bruja-Canwall-Telecan association, 3 to 60 percent slopes
129	Buffork-Bucklon sandy loams, 15 to 60 percent slopes
130	Byrnie-Rock outcrop complex, 10 to 50 percent slopes
131	Calciborolls, 0 to 3 percent slopes
132	Canburn loam, 1 to 4 percent slopes
133	Cantle loam, 0 to 3 percent slopes
134	Carbol-Rock outcrop complex, 25 to 50 percent slopes
135	Carmody-Edlin fine sandy loams, 15 to 45 percent slopes
136	Carmody-Ryan Park fine sandy loams, 6 to 15 percent slopes
137	Cathedral-Spinekop-Rock outcrop complex, 0 to 40 percent slopes
138	Center Creek loam, 0 to 3 percent slopes
139	Chaperton, moderately saline-Blazon complex, 8 to 20 percent slopes
140	Chaperton-Poposhia complex, 3 to 30 percent slopes
141	Cheadle-Passcreek, cobbly subsoil-Rock outcrop complex, 5 to 25 percent slopes
142	Cheadle-Rock outcrop-Miracle complex, 5 to 40 percent slopes
143	Cryaquolls, 1 to 9 percent slopes
144	Cryoborolls, 6 to 30 percent slopes
145	Cushool-Cutback complex, 2 to 10 percent slopes
146	Cushool-Diamondville fine sandy loams, 0 to 3 percent slopes
147	Cutback-Pinelli complex, 1 to 25 percent slopes
148	Dahlquist-Rawlins-Browtine complex, moist, 3 to 15 percent slopes
149	Dalecreek-Kovich complex, 0 to 9 percent slopes
150	Delphill-Blazon complex, 3 to 20 percent slopes
151	Diamondville-Cushool complex, 3 to 15 percent slopes
152	Diamonkit-Stylite sandy loams, 3 to 15 percent slopes
153	Elkol clay loam, 0 to 8 percent slopes
154	Elkol-Gerdrum family complex, 1 to 8 percent slopes
155	Elkol-Gerdrum family, overflow complex, 0 to 3 percent slopes
156	Evanston fine sandy loam, 0 to 6 percent slopes
157	Evanston-Bonjea complex, 5 to 40 percent slopes
158	Fiveoh-Fiveoh, cobbly substratum-Ryan Park complex, 1 to 8 percent slopes
159	Fiveoh, cobbly substratum-Fiveoh-Urban Land complex, 1 to 5 percent slopes
160	Fiveoh, cobbly substratum-Joemre fine sandy loams, 1 to 5 percent slopes
161	Folavar very gravelly sandy loam, 0 to 3 percent slopes
162	Folavar-Borollic Camborthids complex, 0 to 3 percent slopes
163	Forelle loam, 0 to 6 percent slopes
164	Forelle-Urban Land complex, 0 to 3 percent slopes
165	Forelle-Diamondville association, 3 to 15 percent slopes
166	Glendive-Redrob-Grenoble complex, 0 to 3 percent slopes
167	Grenoble-Gerrard complex, 0 to 3 percent slopes
168	Greyback very cobbly sandy loam, 1 to 6 percent slopes
169	Gypla loam, 0 to 3 percent slopes
170	Gypla-Urban Land complex, 0 to 1 percent slopes
171	Hanson-Quander complex, 3 to 15 percent slopes
172	Hapjack-Rogert-Amesmont complex, 3 to 25 percent slopes
173	Ipson-Evanston complex, 6 to 30 percent slopes
174	Joemre fine sandy loam, 3 to 6 percent slopes
175	Joemre fine sandy loam, 6 to 15 percent slopes
176	Kezar-Carbol-Rock outcrop complex, 5 to 25 percent slopes
177	Kildor-Rock outcrop association, 5 to 50 percent slopes
178	Kiltabar-Tismid complex, 0 to 3 percent slopes
179	Lakehelen-Redfeather-Amesmont complex, 5 to 20 percent slopes
180	Leavitt gravelly fine sandy loam, 1 to 8 percent slopes
181	Leavitt-Granile complex, 3 to 45 percent slopes
182	Leavitt-Hanson complex, 3 to 30 percent slopes
183	Leavitt-Quander complex, 15 to 45 percent slopes
184	Luhon loam, 1 to 5 percent slopes
185	Luvar-Stylite-Diamonkit complex, 1 to 8 percent slopes
186	Lymanson loam-Lymanson cobbly loam complex, 6 to 20 percent slopes
187	Manada sandy loam, 0 to 6 percent slopes
188	McFadden gravelly fine sandy loam, 1 to 6 percent slopes
189	Miracle-Cheadle association, 5 to 20 percent slopes
190	Moyerson-Kemmerer complex, 3 to 20 percent slopes
191	Nathale-Passcreek, cobbly subsoil-Rock outcrop complex, 10 to 60 percent slopes
192	Pahlow gravelly sandy loam, 0 to 3 percent slopes
193	Pilotpeak-Canwall complex, 3 to 20 percent slopes
194	Pinelli clay loam, 0 to 6 percent slopes
195	Pits, mine
196	Poin-Bowen-Rock outcrop complex, 10 to 50 percent slopes
197	Poposhia-Blazon complex, 3 to 15 percent slopes
198	Poposhia-Forelle complex, 1 to 8 percent slopes
199	Poposhia-Chaperton association, 6 to 12 percent slopes
200	Rainbolt-Morset association, 3 to 25 percent slopes
201	Redfeather-Lakehelen-Rogert complex, 20 to 50 percent slopes
202	Redrob loam, 0 to 2 percent slopes
203	Redrob, frequently flooded-Grenoble-Redrob complex, 0 to 3 percent slopes
204	Redrob, frequently flooded-Redrob loams, 0 to 3 percent slopes
205	Redrob, frequently flooded-Redrob-Urban Land complex, 0 to 3 percent slopes
206	Rentsac-Wycolo complex, 2 to 15 percent slopes
207	Renvers-Chalkhill complex, 1 to 15 percent slopes
208	Rimton-Passcreek, cobbly subsoil-Miracle complex, 10 to 60 percent slopes
209	Riverwash
210	Rock outcrop-Bonjea complex, 40 to 60 percent slopes
211	Rock outcrop-Bruja-Byrnie complex, 30 to 70 percent slopes
212	Rock outcrop-Cathedral complex, 20 to 40 percent slopes
213	Rock outcrop-Cathedral-Alderon complex, 25 to 50 percent slopes
214	Rock outcrop-Pilotpeak complex, 3 to 25 percent slopes
215	Rock outcrop-Rogert complex, 25 to 99 percent slopes
216	Rock River sandy loam, 2 to 6 percent slopes
217	Rock River loam, 1 to 8 percent slopes, bouldery
218	Rock River-Urban Land complex, 0 to 6 percent slopes
219	Rogert-Lakehelen-Rock outcrop complex, 8 to 40 percent slopes
220	Rogert-Rock outcrop-Amesmont complex, 5 to 25 percent slopes
221	Rohonda fine sandy loam, 3 to 6 percent slopes
222	Rohonda-Tieside complex, 3 to 10 percent slopes
223	Rohonda-Cheadle-Rock outcrop association, 6 to 45 percent slopes
224	Ryark loamy sand, 1 to 6 percent slopes
225	Shirleybasin-Twocabin-Lahtida complex, 0 to 15 percent slopes
226	Silas loam, 1 to 6 percent slopes
227	Silas, gravelly substratum-Vensora loams, 0 to 6 percent slopes
228	Stunner sandy loam, 2 to 8 percent slopes
229	Stunner-Borollic Camborthids complex, 2 to 5 percent slopes
230	Stunner-Tisworth-Blazon complex, 1 to 6 percent slopes
231	Stunner-Urban Land complex, 0 to 6 percent slopes
232	Teeler very gravelly sandy loam, 5 to 40 percent slopes
233	Thiel-Lymanson-Leavitt complex, 5 to 20 percent slopes
234	Tieside-Pilotpeak-Rock outcrop complex, 3 to 10 percent slopes
235	Tismid sandy loam, 0 to 5 percent slopes
236	Tisworth-Gerdrum family loams, 1 to 8 percent slopes
237	Tisworth-Gerdrum family complex, 0 to 6 percent slopes
238	Tule-Chalkville loams, 0 to 15 percent slopes
239	Tyzak-Rock outcrop complex, 30 to 60 percent slopes
240	Wycolo sandy loam, 3 to 6 percent slopes
241	Wycolo-Alcova complex, 3 to 10 percent slopes
242	Wycolo-Alcova-Urban Land complex, 3 to 6 percent slopes
243	Wycolo-Tieside sandy loams, 3 to 10 percent slopes
244	Wycolo-Thermopolis-Rock outcrop complex, 10 to 50 percent slopes
W	Water

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (FLOOD POOL LINE)

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER
(sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate (173)
- Federal (287)
- State (52)
- County, farm or ranch (1283)

RAILROAD

POWER TRANSMISSION LINE
(normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or Small (Named where applicable) (water)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban area) (occupied)
- Church
- School
- Indian mound (label) (Indian Mound)
- Located object (label) (Tower)
- Tank (label) (Gas)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) (CANAL)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial
- Intermittent

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (101, 200)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

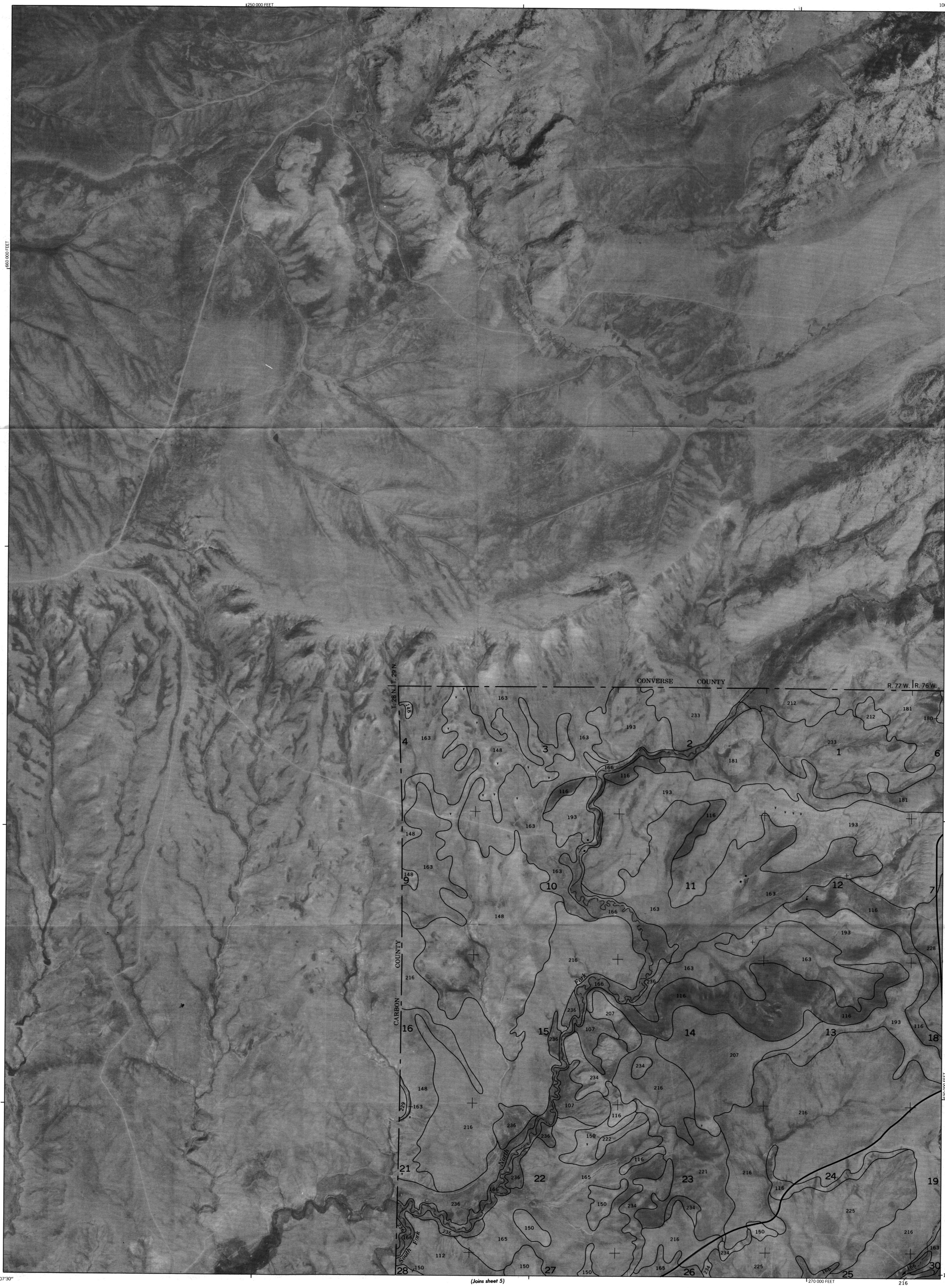
GULLY

DEPRESSION OR SINK

SOIL SAMPLE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Patterned ground



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

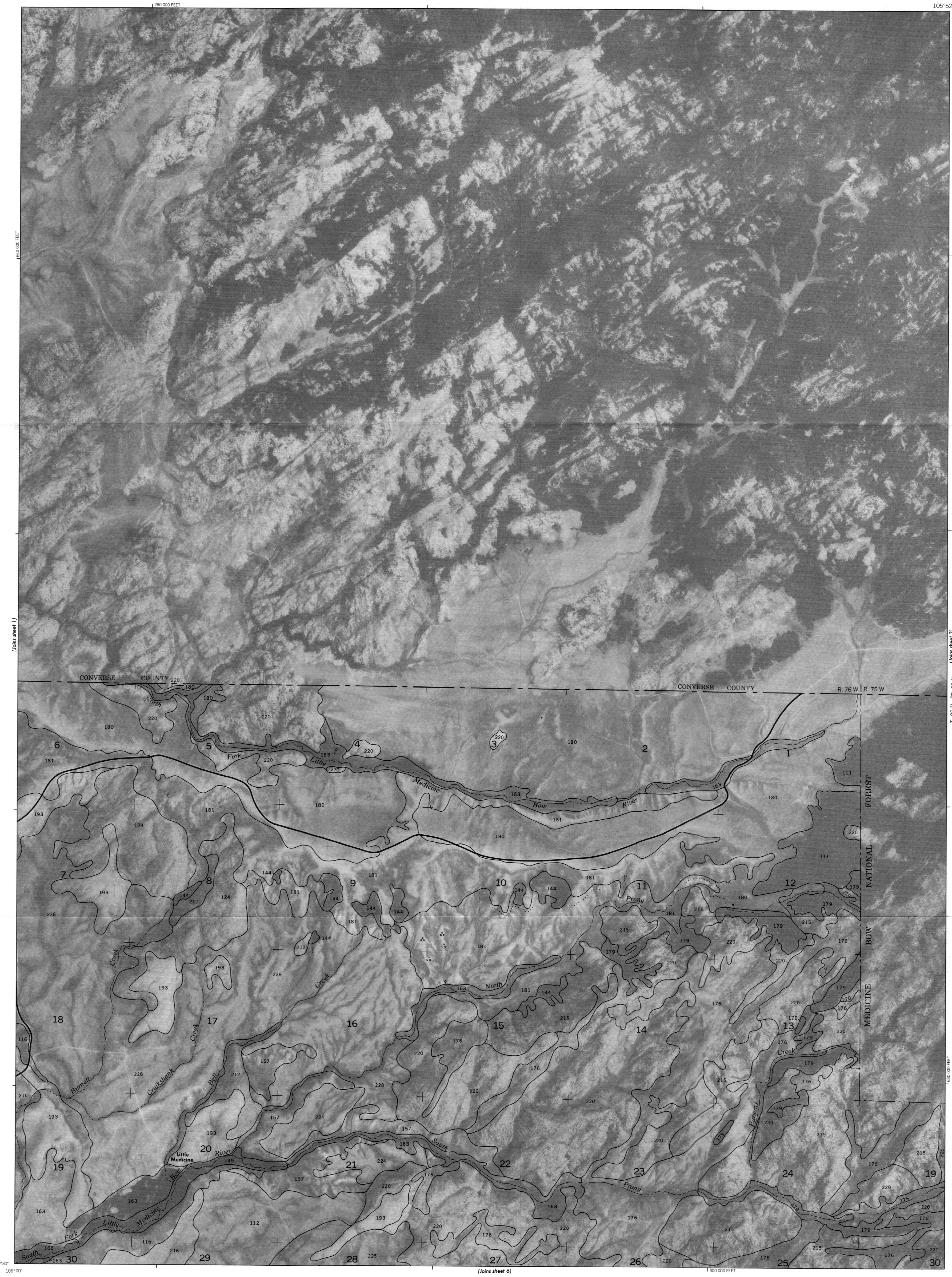
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 1



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1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 2

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1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 3

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

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ALBANY COUNTY, WYOMING NO. 4

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

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ALBANY COUNTY, WYOMING NO. 5

N

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

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ALBANY COUNTY, WYOMING NO. 6

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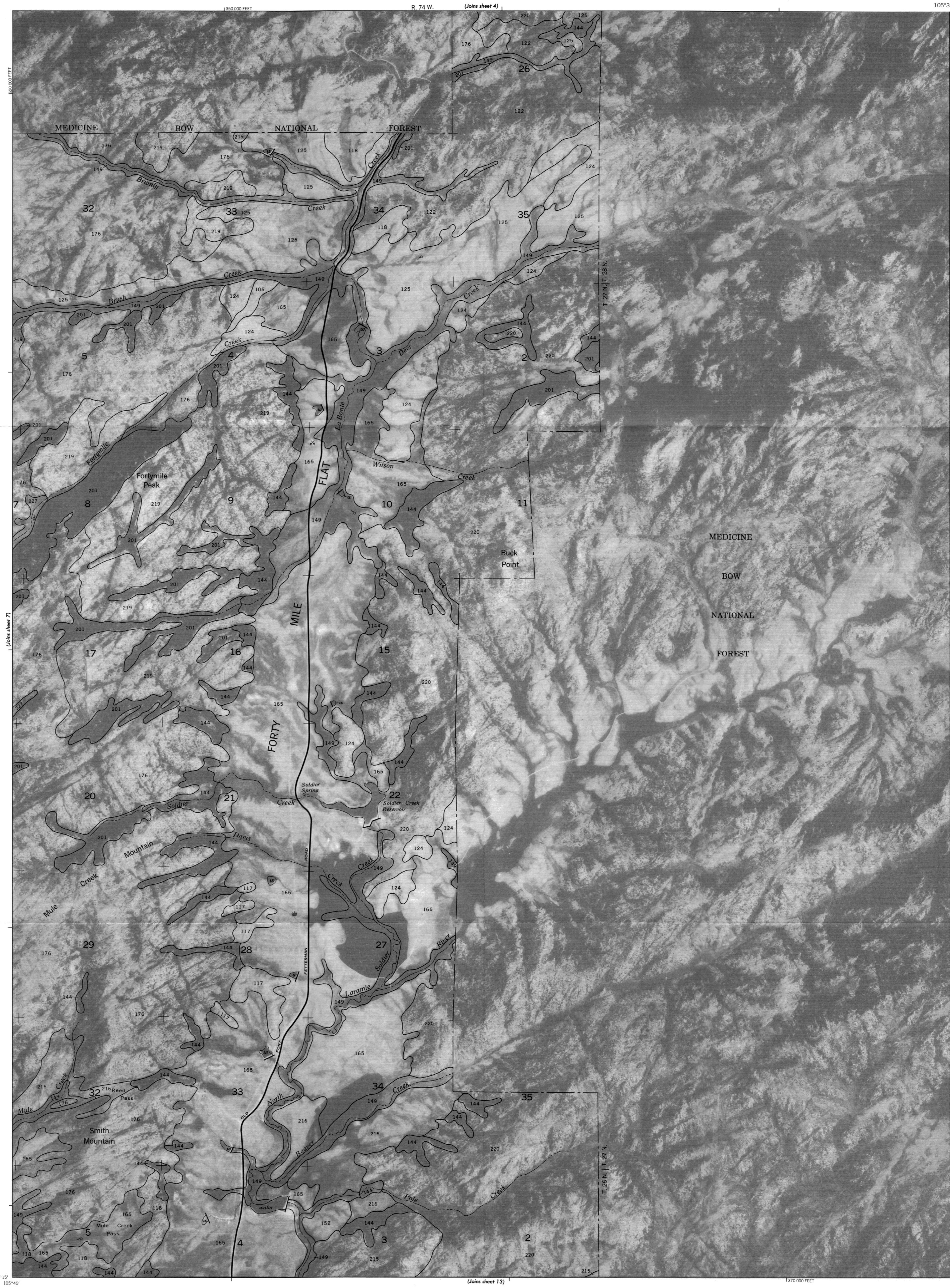
1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 7



SCALE 1:24 000

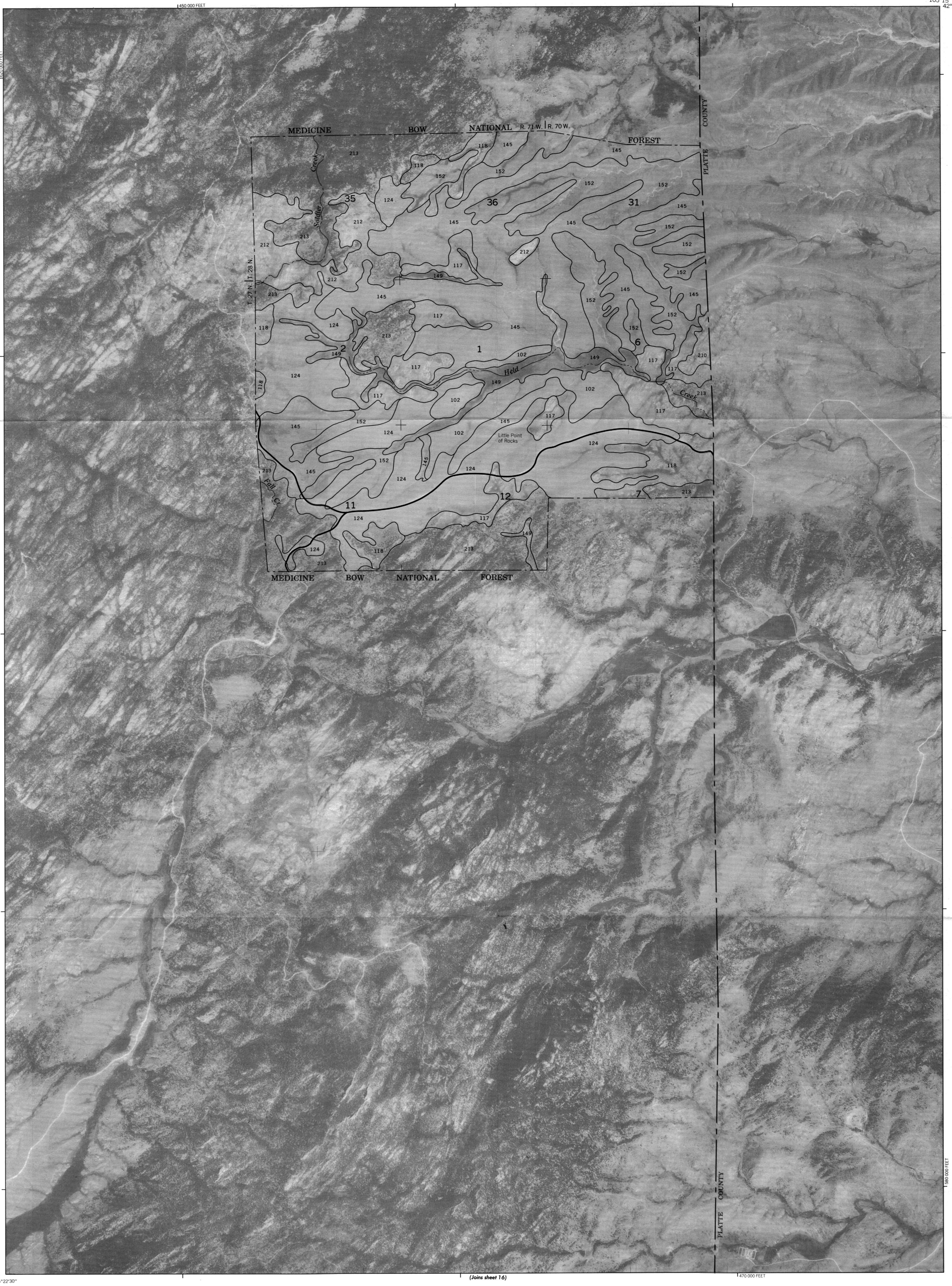
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

105°15'
42°22'30"



42°15'
105°22'30"

(Joins sheet 16)

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 9

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

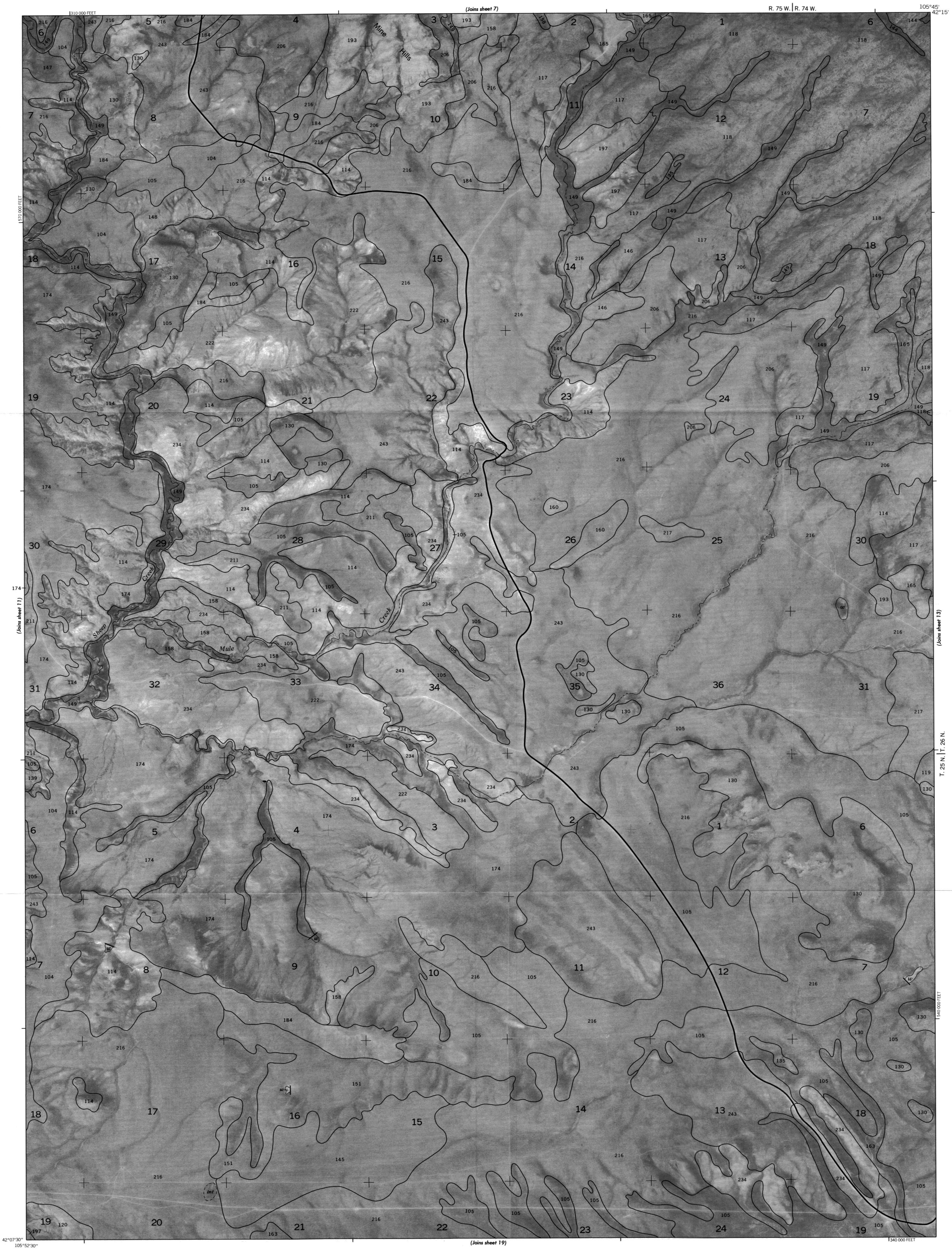
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

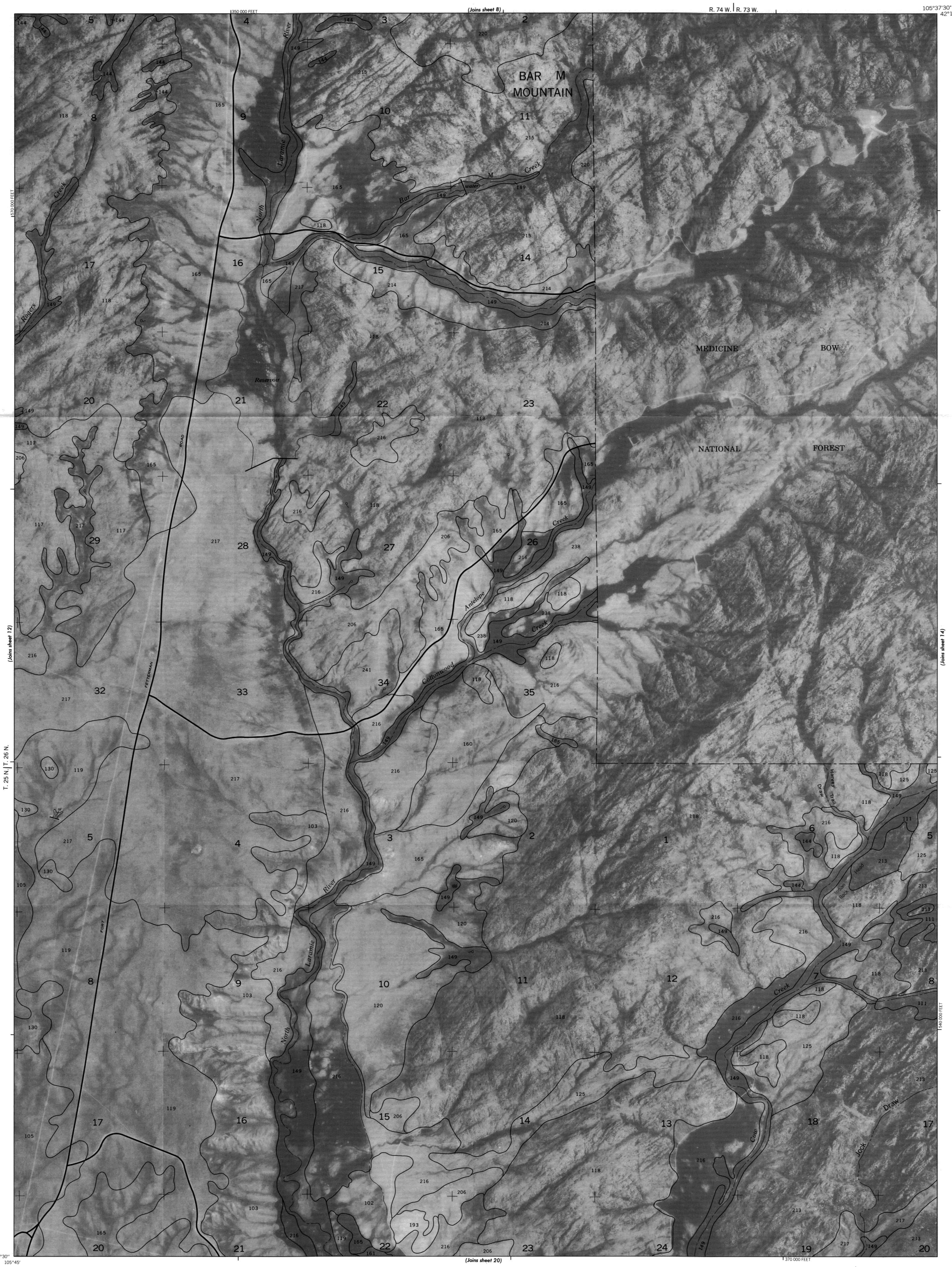
ALBANY COUNTY, WYOMING NO. 11



1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

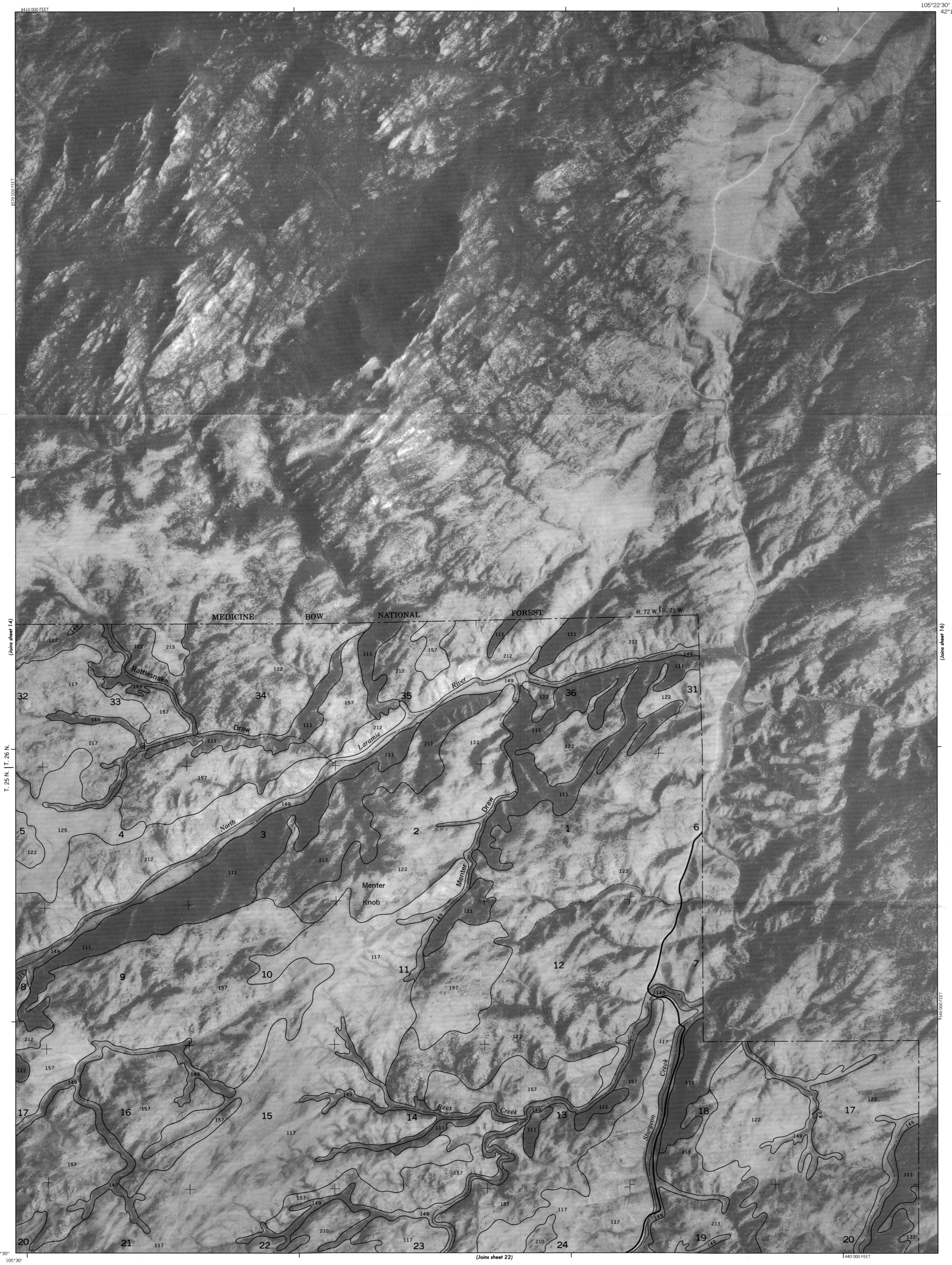
1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

ALBANY COUNTY, WYOMING NO. 13

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

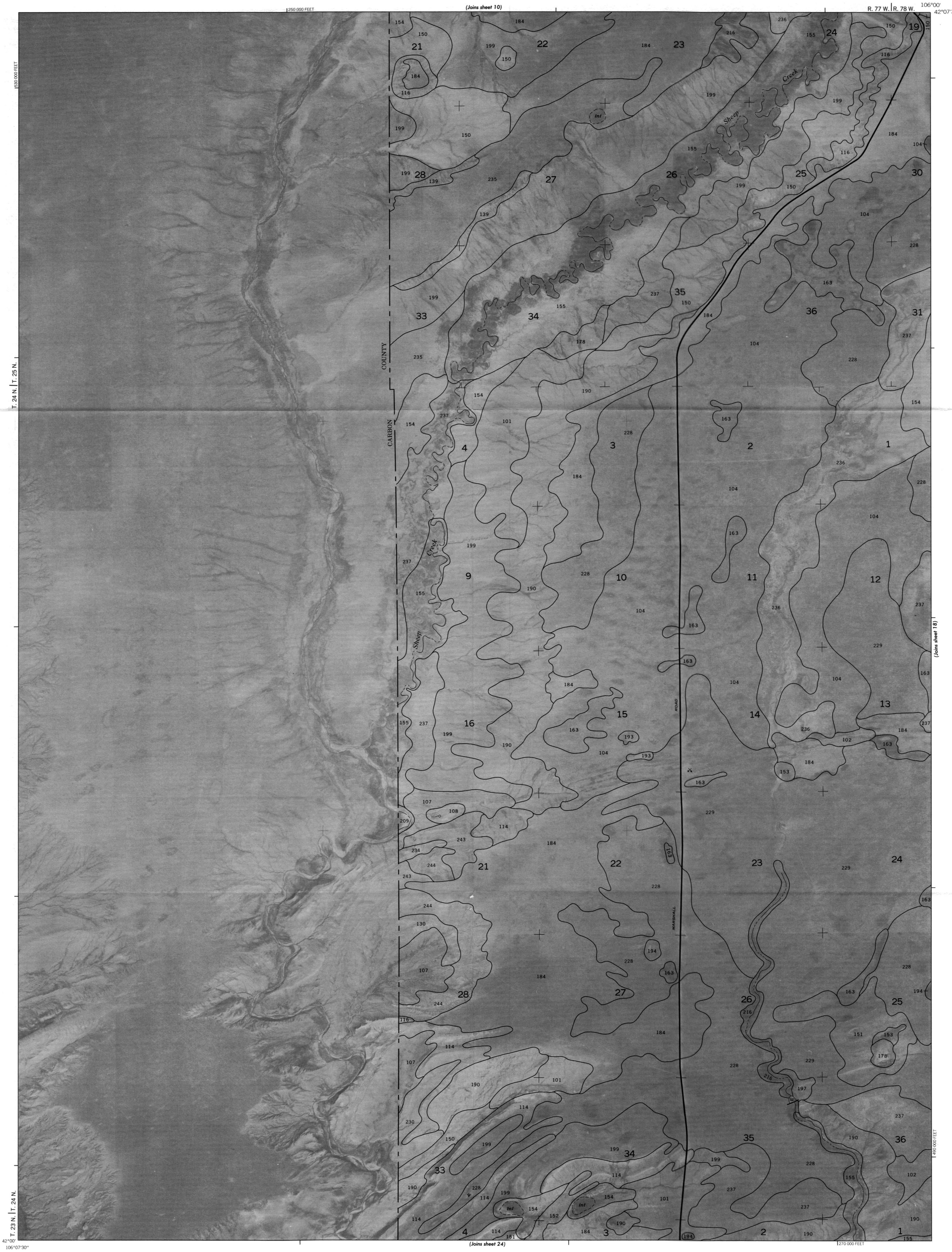
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



1	3/4	1/2	1/4	0

1 — 0 — 2 MILES

1 — 0.5 — 0 — 1 — 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

SCALE 1:24 000

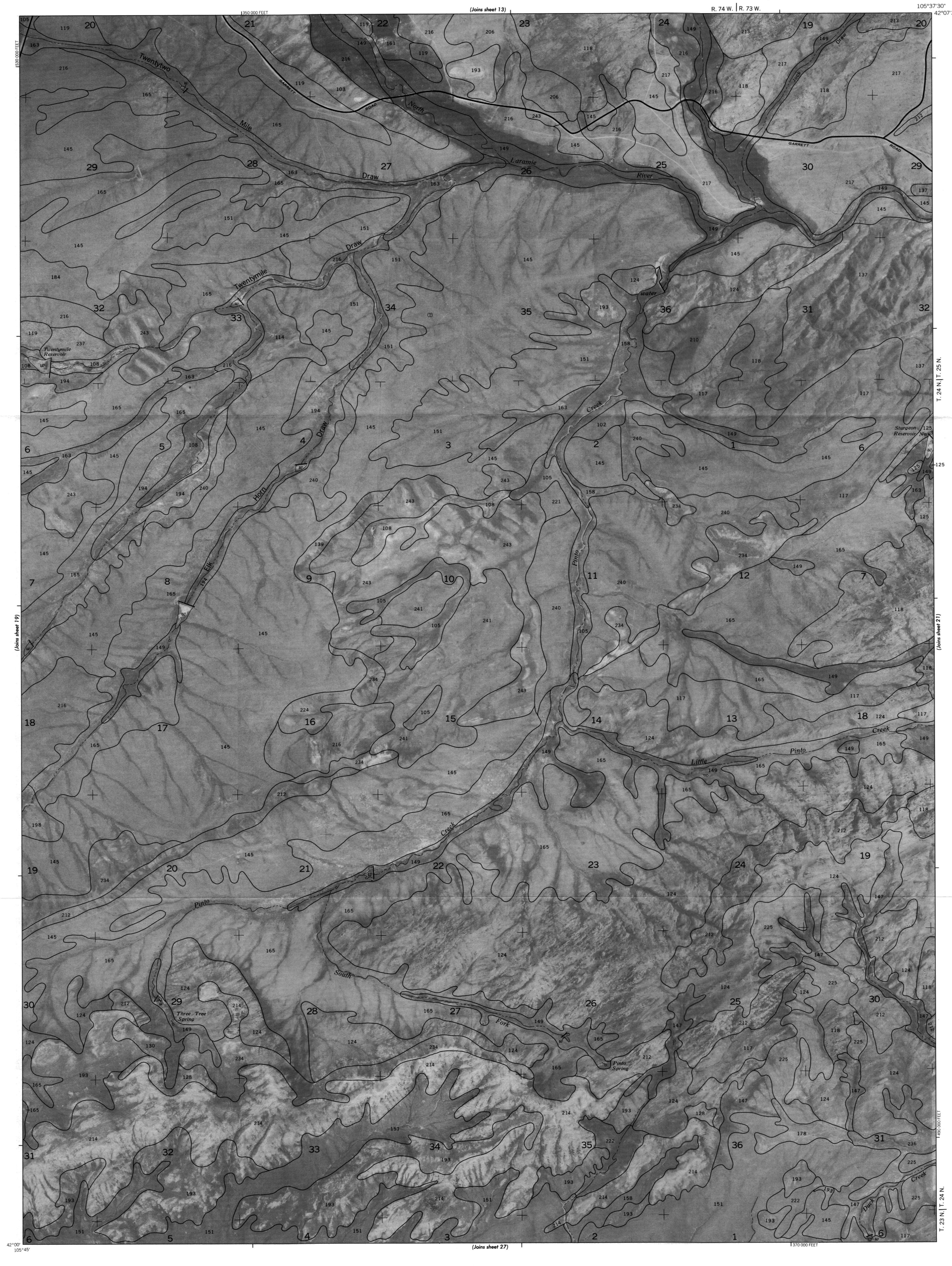
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

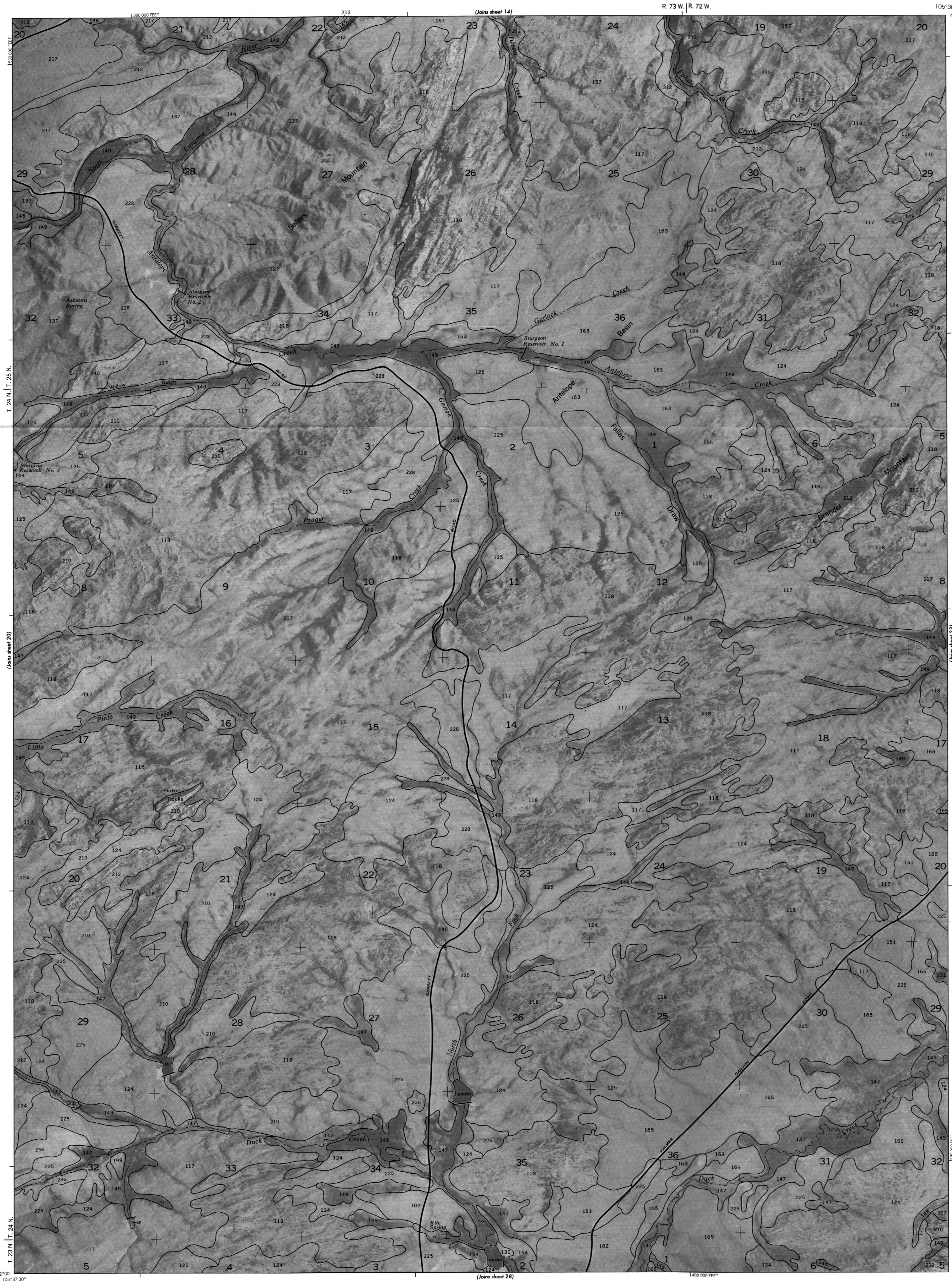
ALBANY COUNTY, WYOMING NO. 19



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

ALBANY COUNTY, WYOMING NO. 20



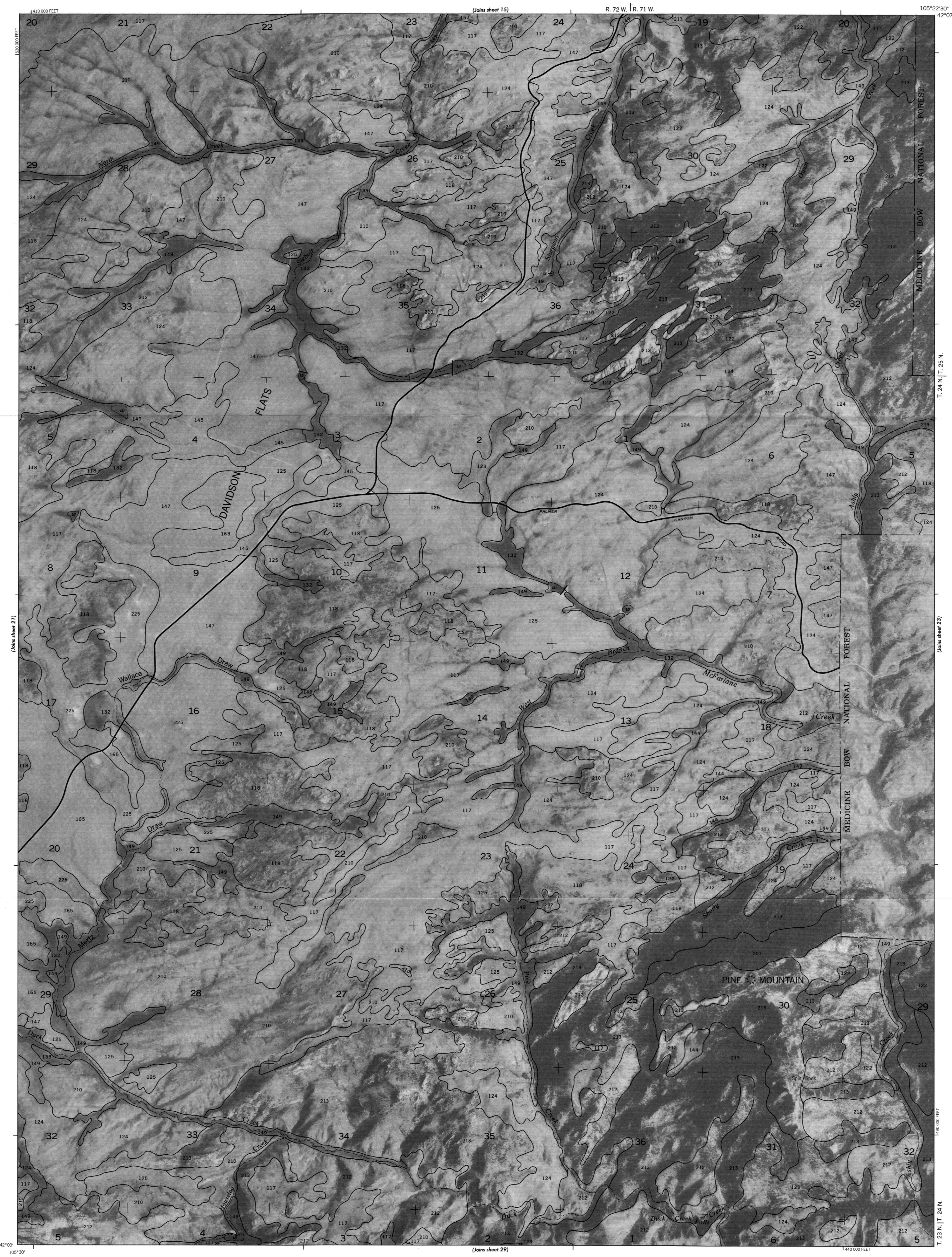
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 23

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SHEET NUMBER 26
SOIL SURVEY OF ALBANY COUNTY AREA, WYOMING

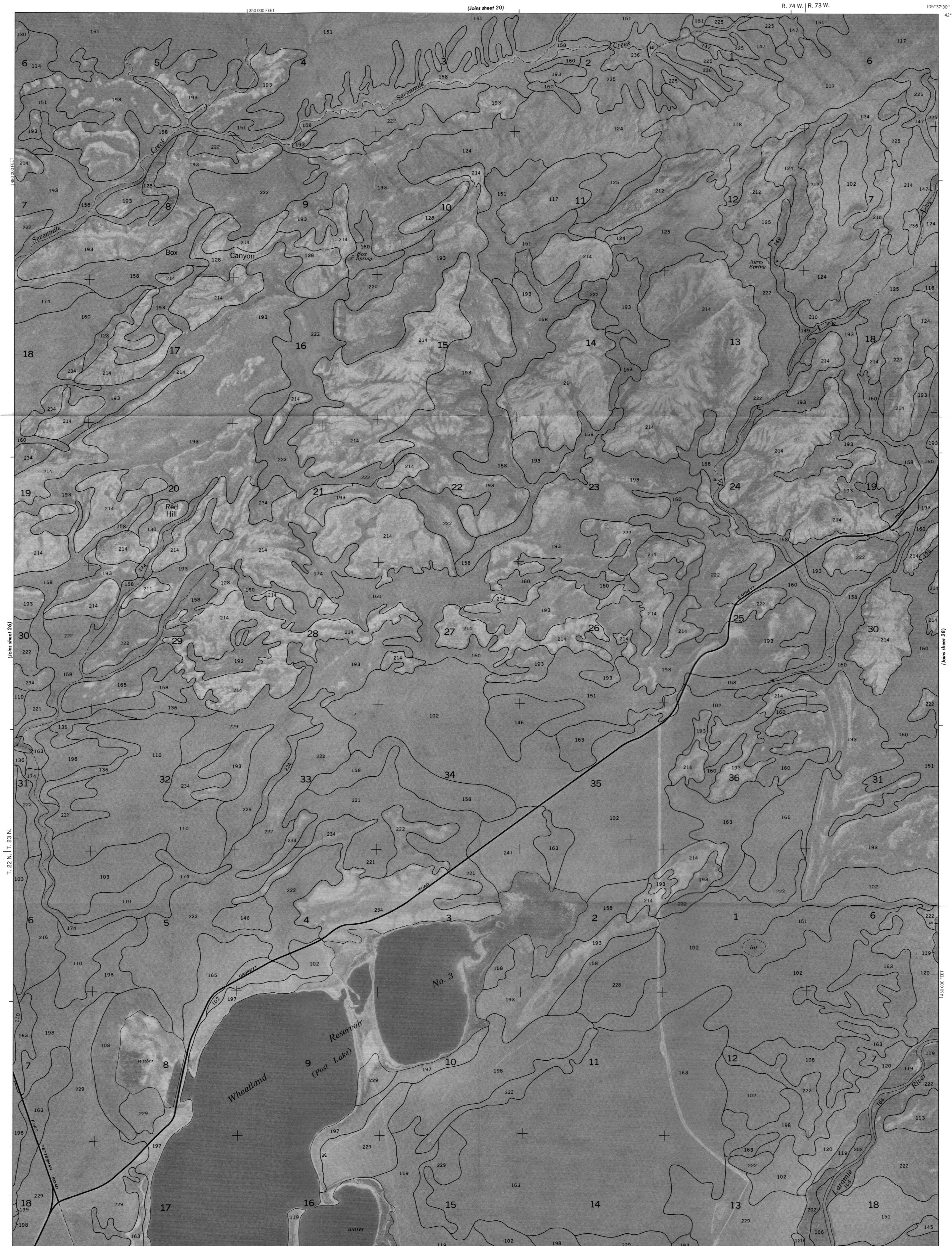
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 26

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

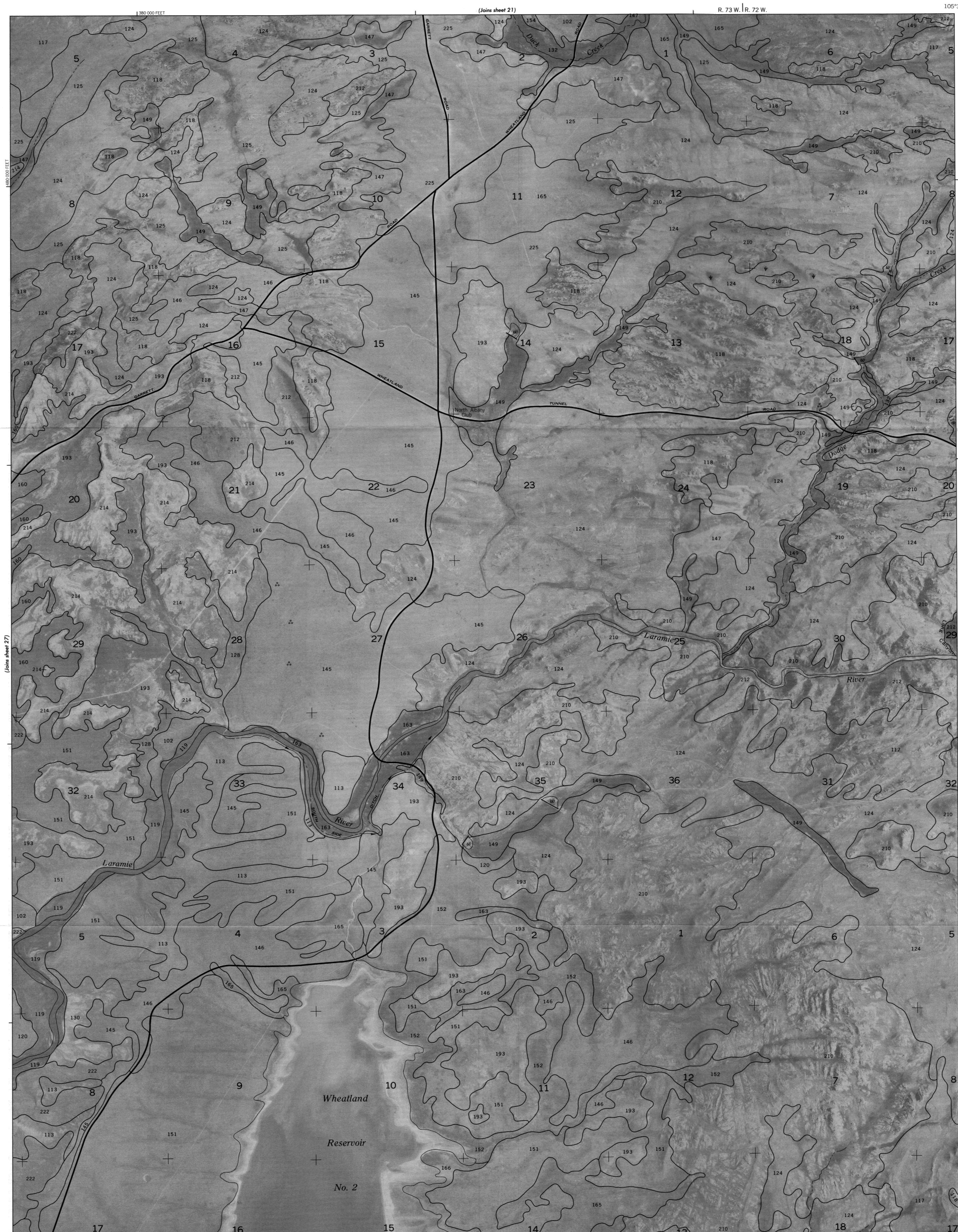


This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 27



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

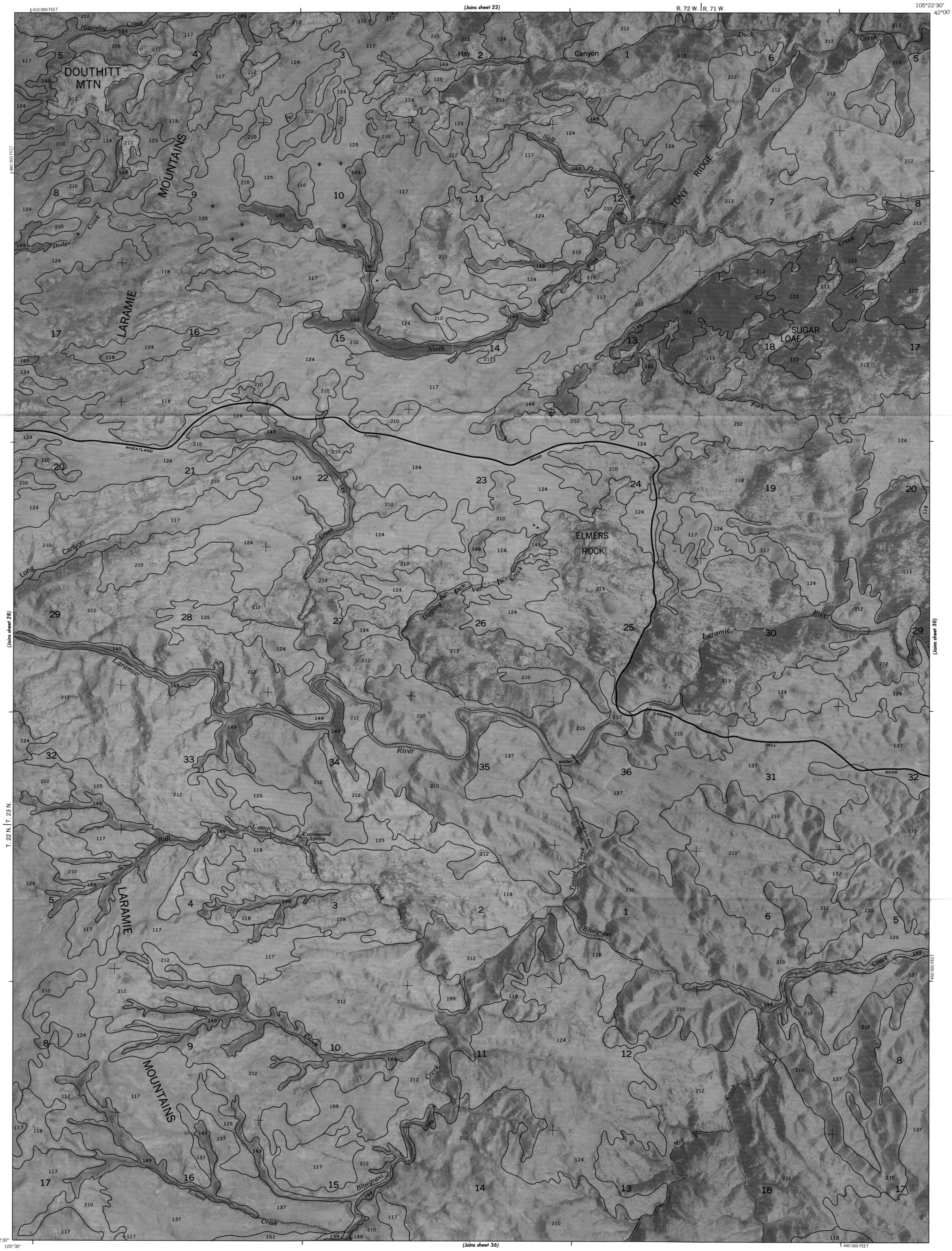
SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

N

ALBANY COUNTY, WYOMING NO. 28



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

ALBANY COUNTY, WYOMING NO. 30

N

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

ALBANY COUNTY, WYOMING NO. 31

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

ALBANY COUNTY, WYOMING NO. 32

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 33

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

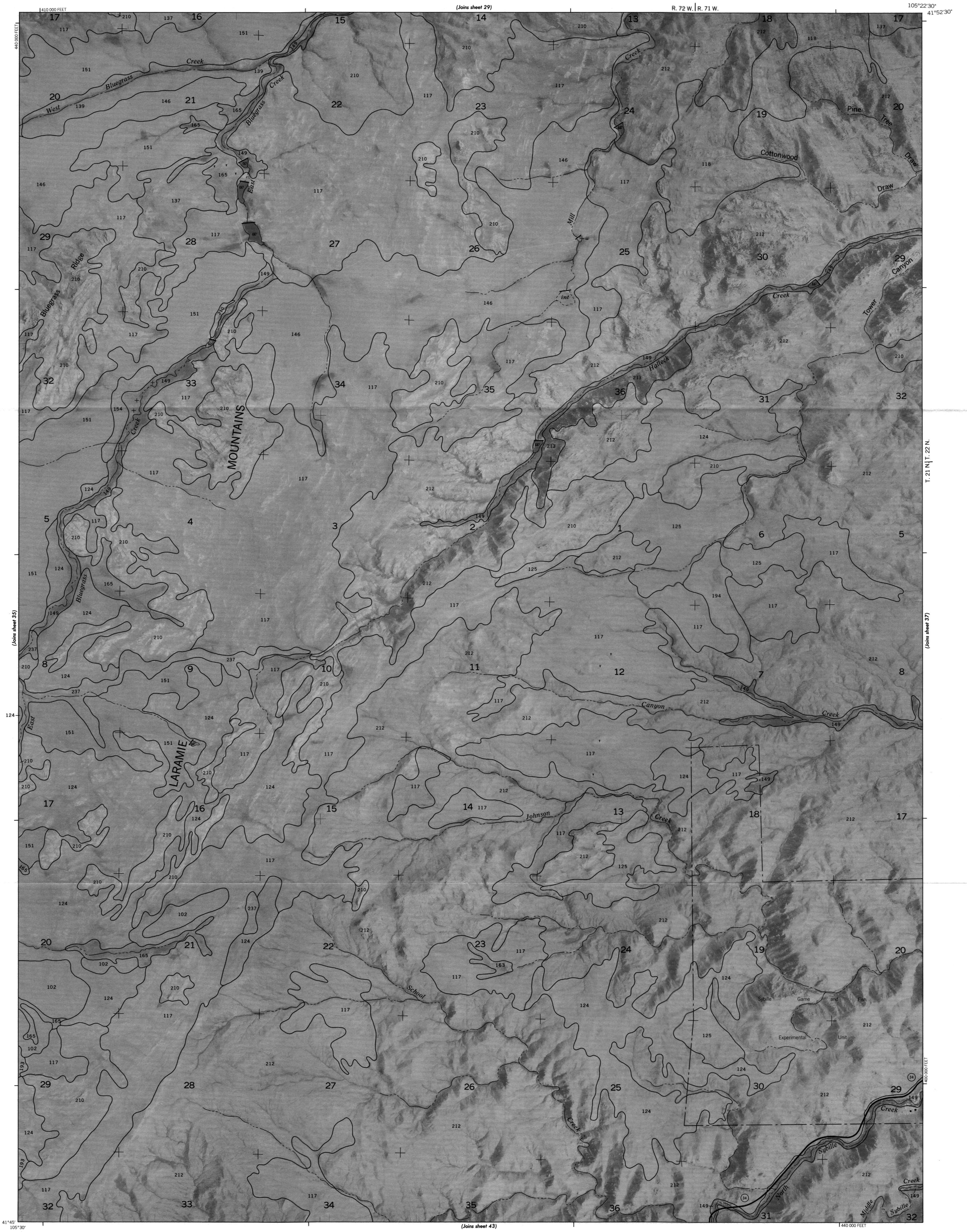
ALBANY COUNTY, WYOMING NO. 34

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



1 3/4 1/2 1/4 0 1 2 MILES

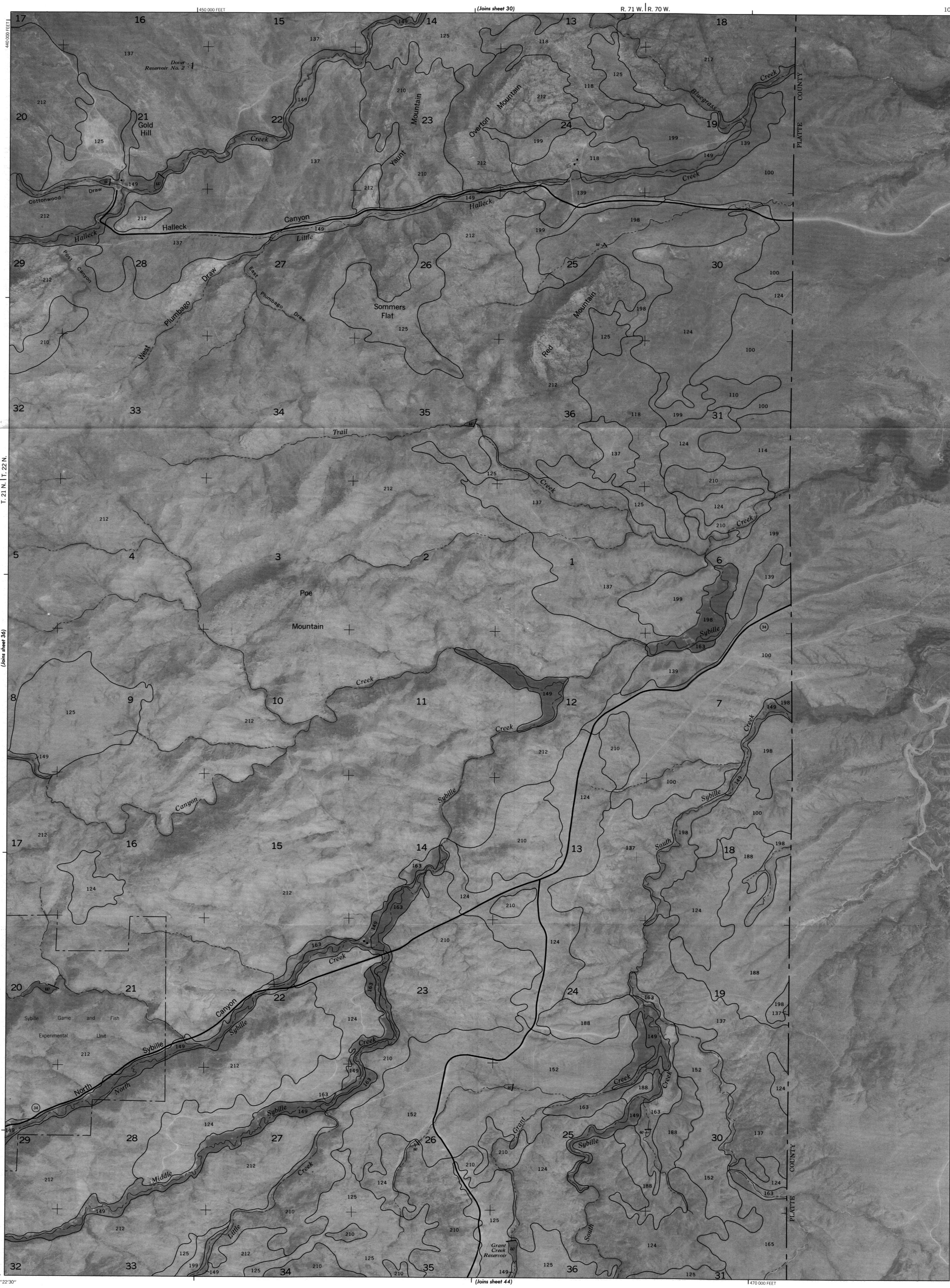
1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

ALBANY COUNTY, WYOMING NO. 36

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

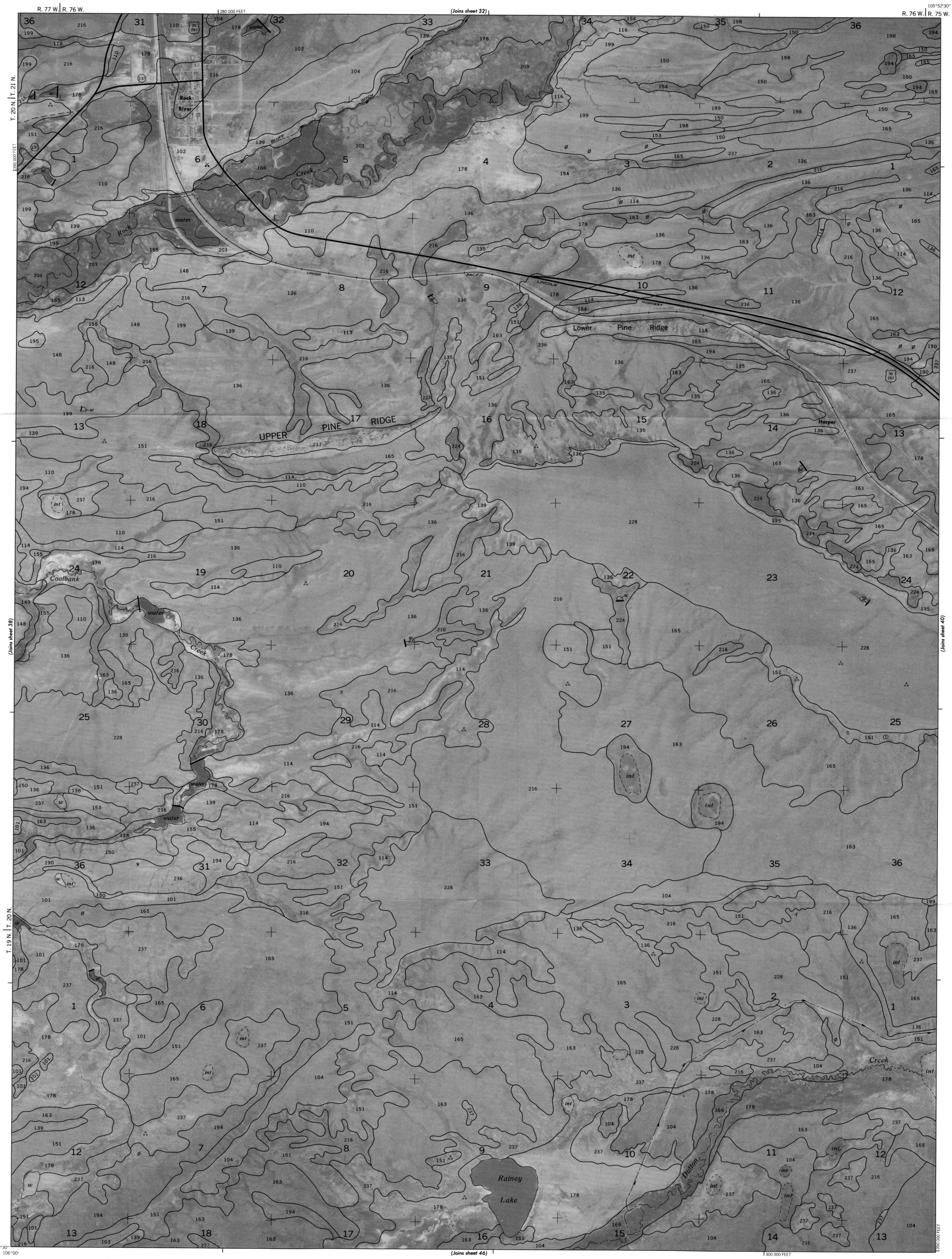
N

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 39

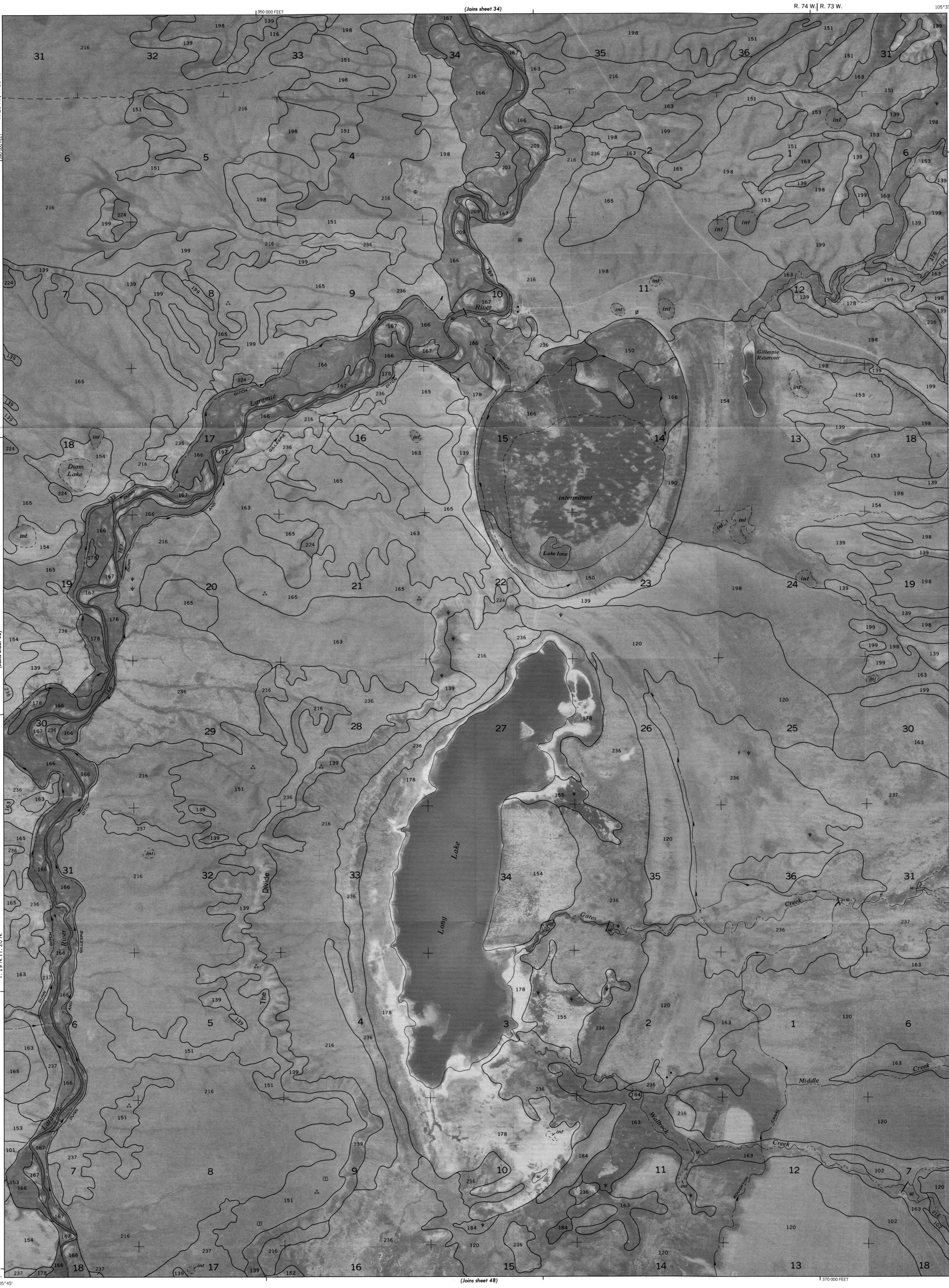
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N



1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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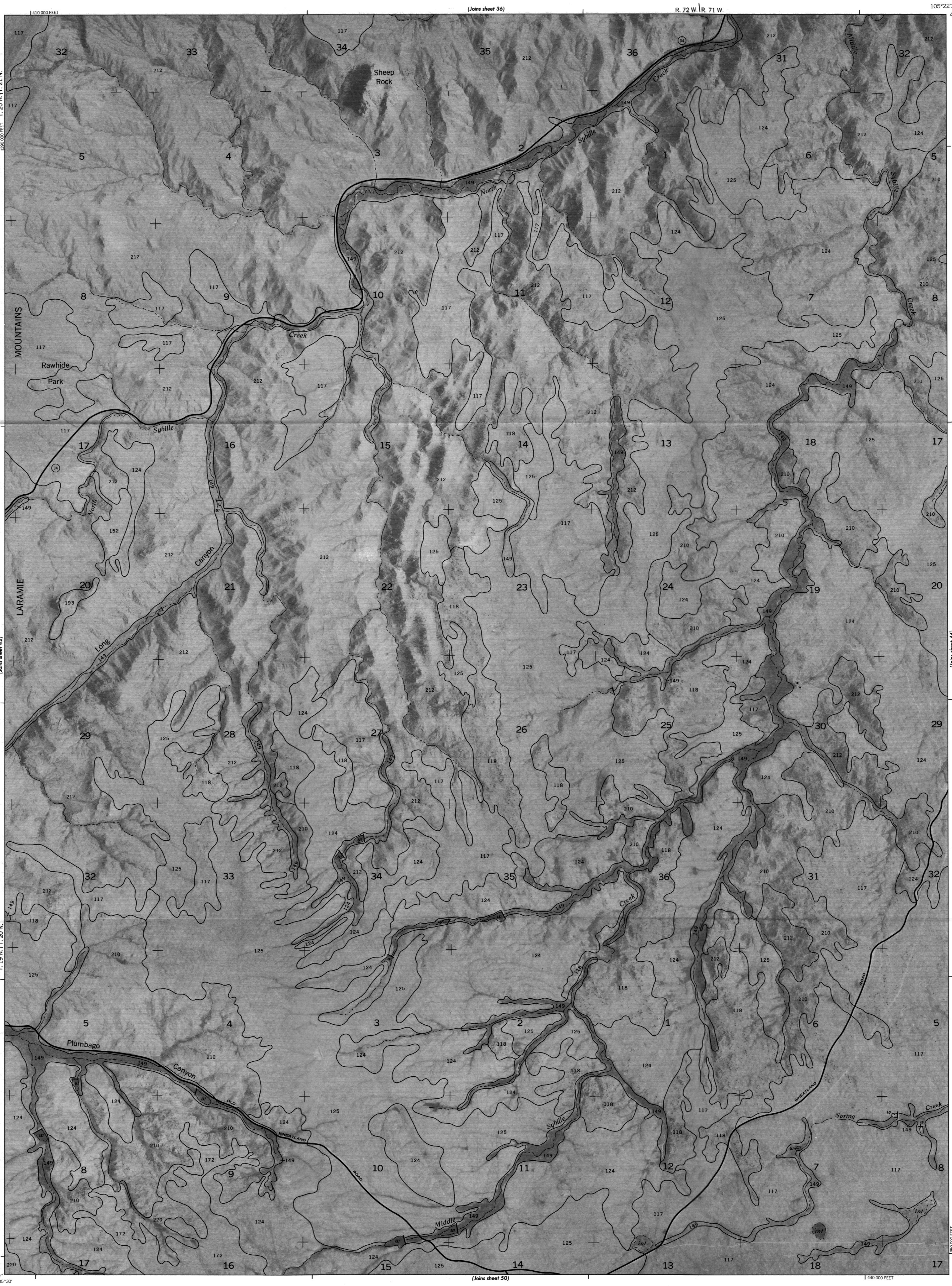
1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

ALBANY COUNTY, WYOMING NO. 42

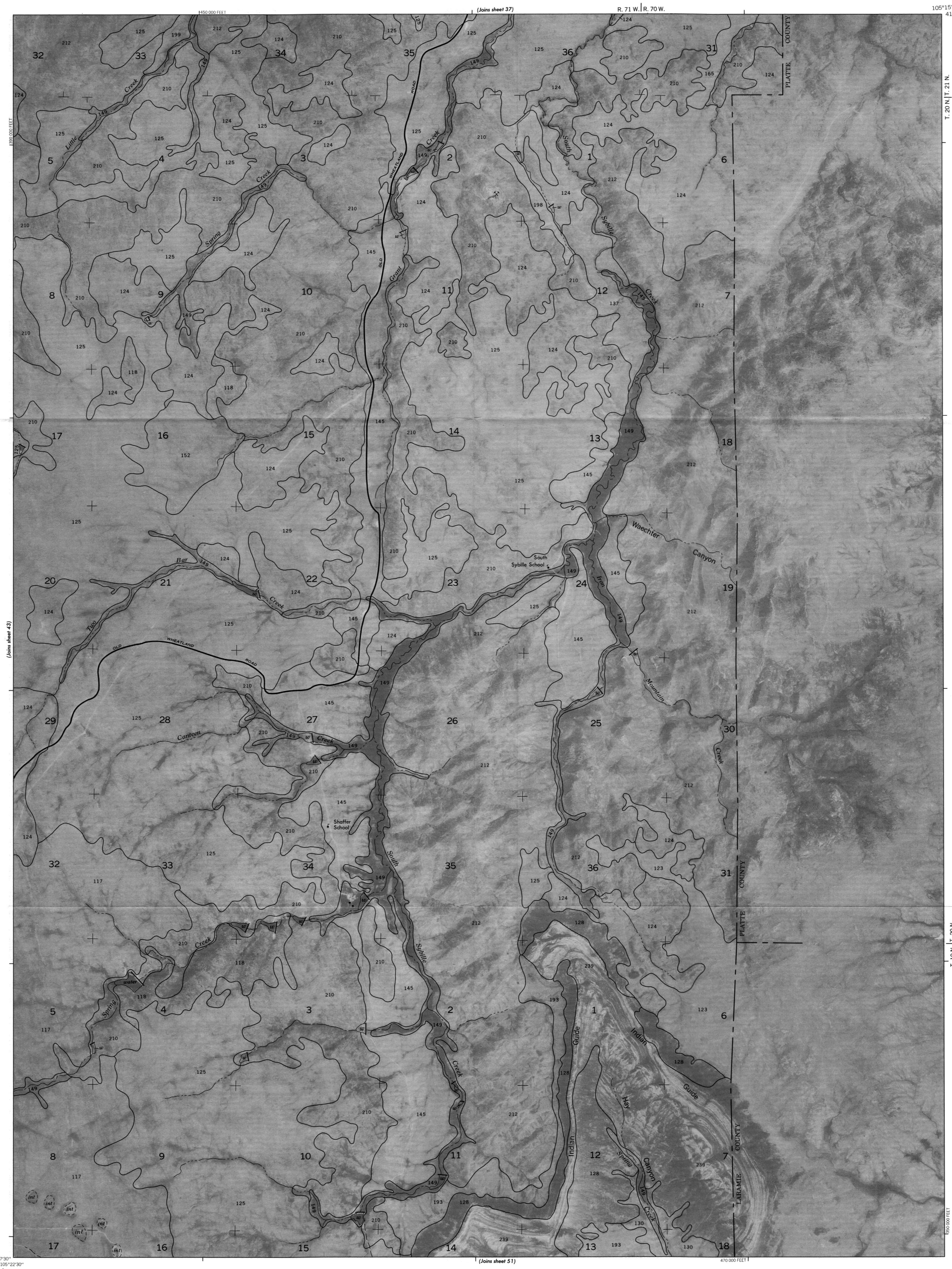
N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

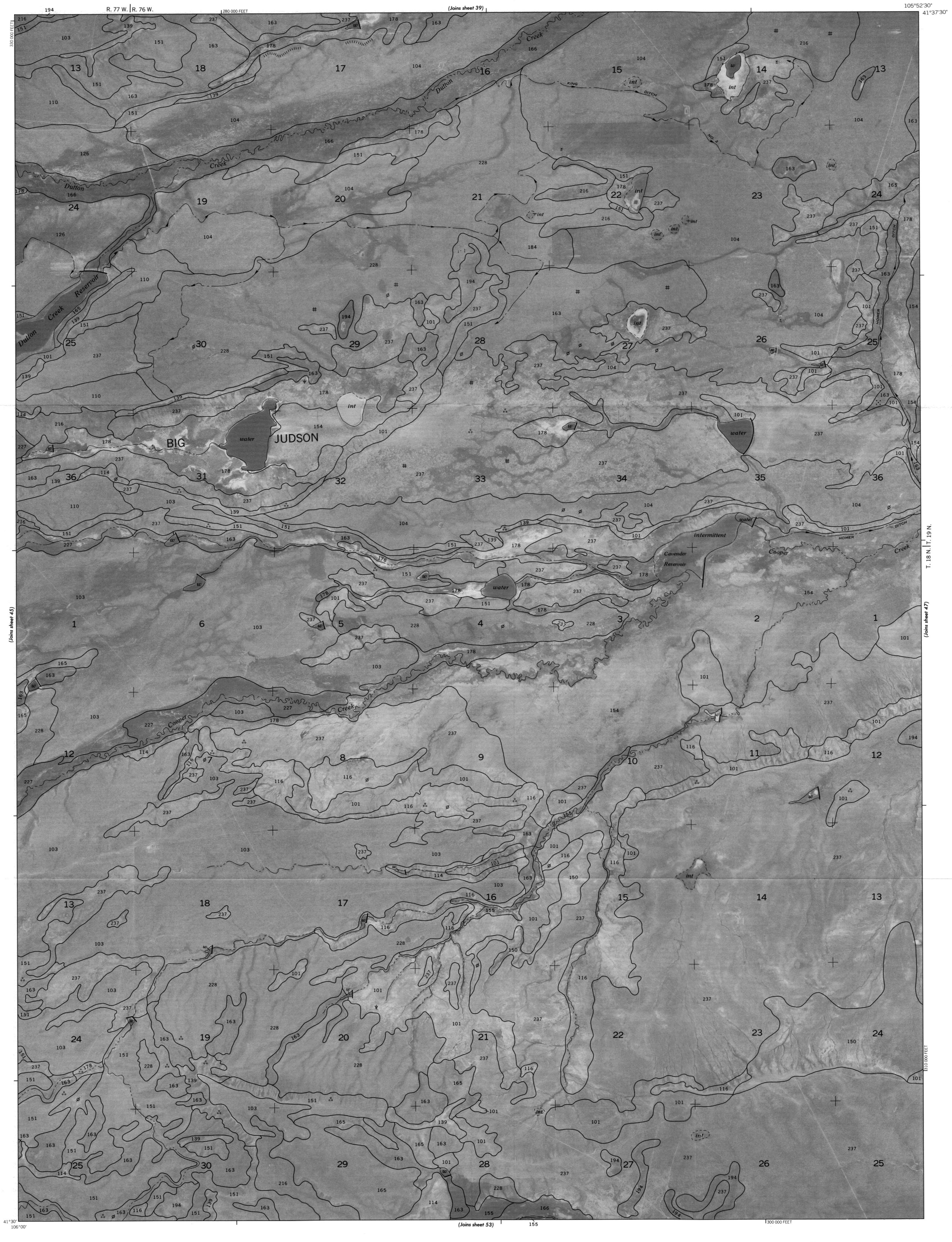
1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 46

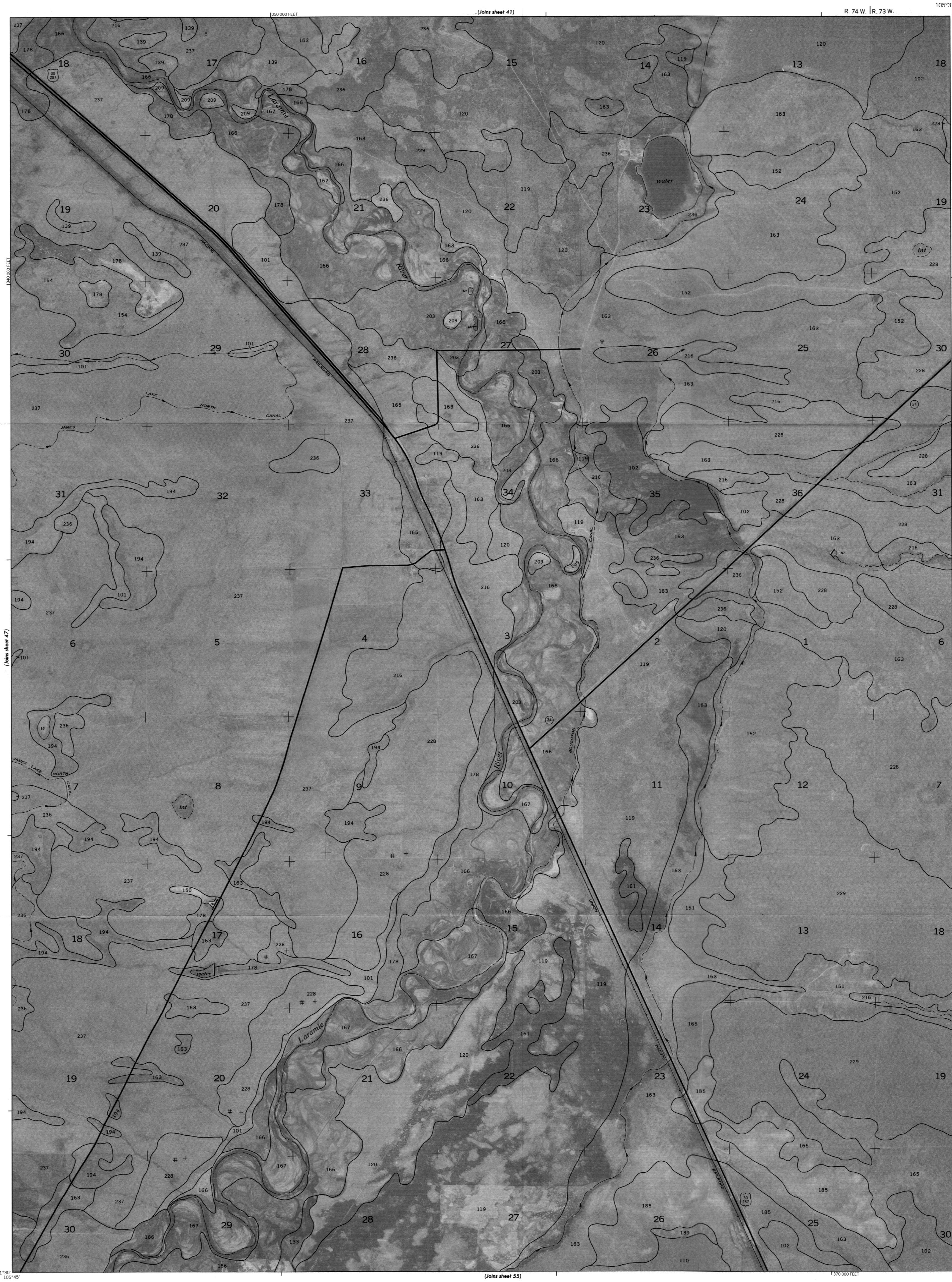
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 47

105°37'30"
41°37'30"
R. 74 W. | R. 73 W.
(Joins sheet 41)
350 000 FEET



(Joins sheet 47)
(Joins sheet 49)
T. 18 N. | T. 19 N.
340 000 FEET
310 000 FEET
41°30'
105°45'
(Joins sheet 55)
370 000 FEET

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 48

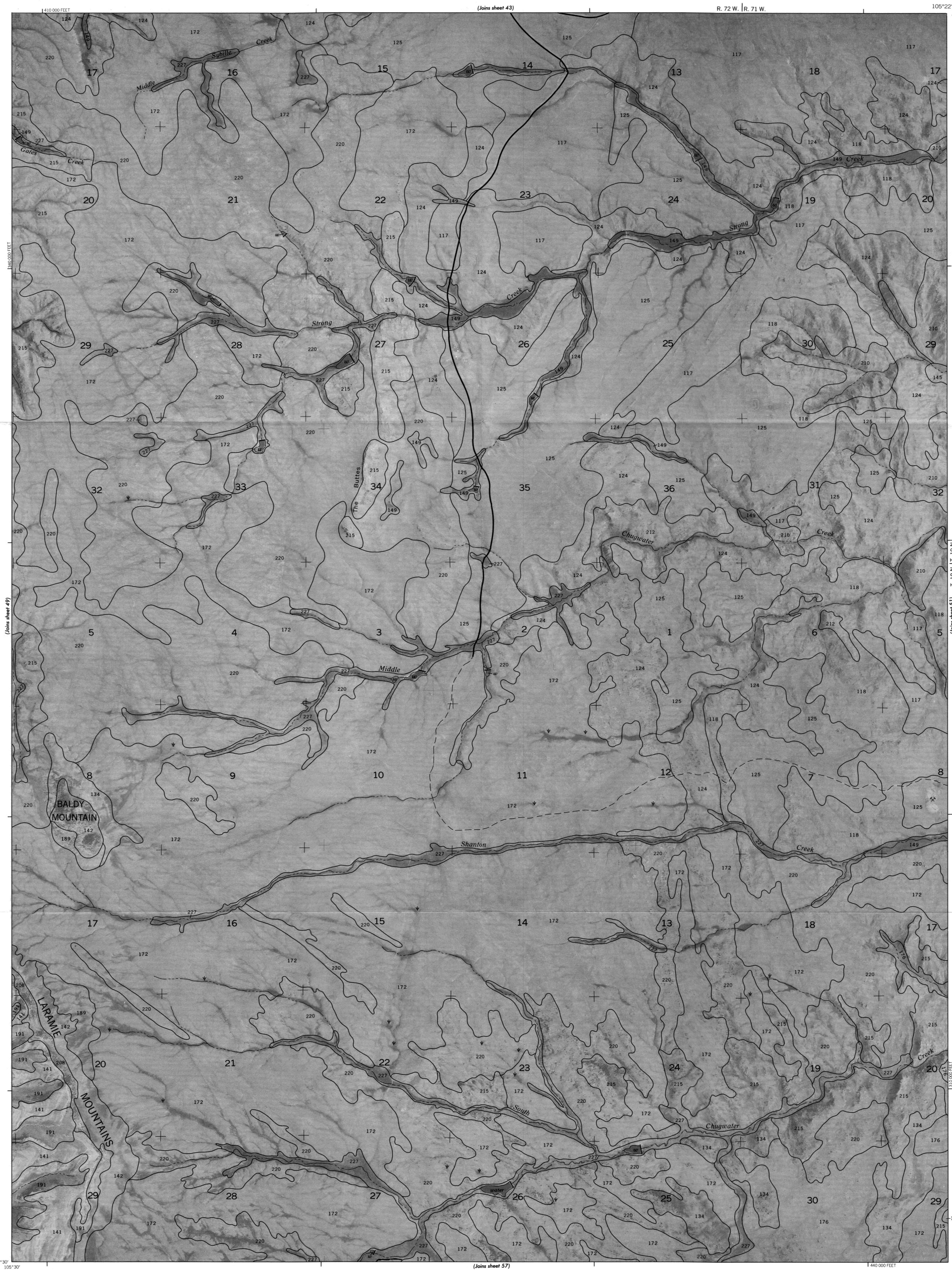
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

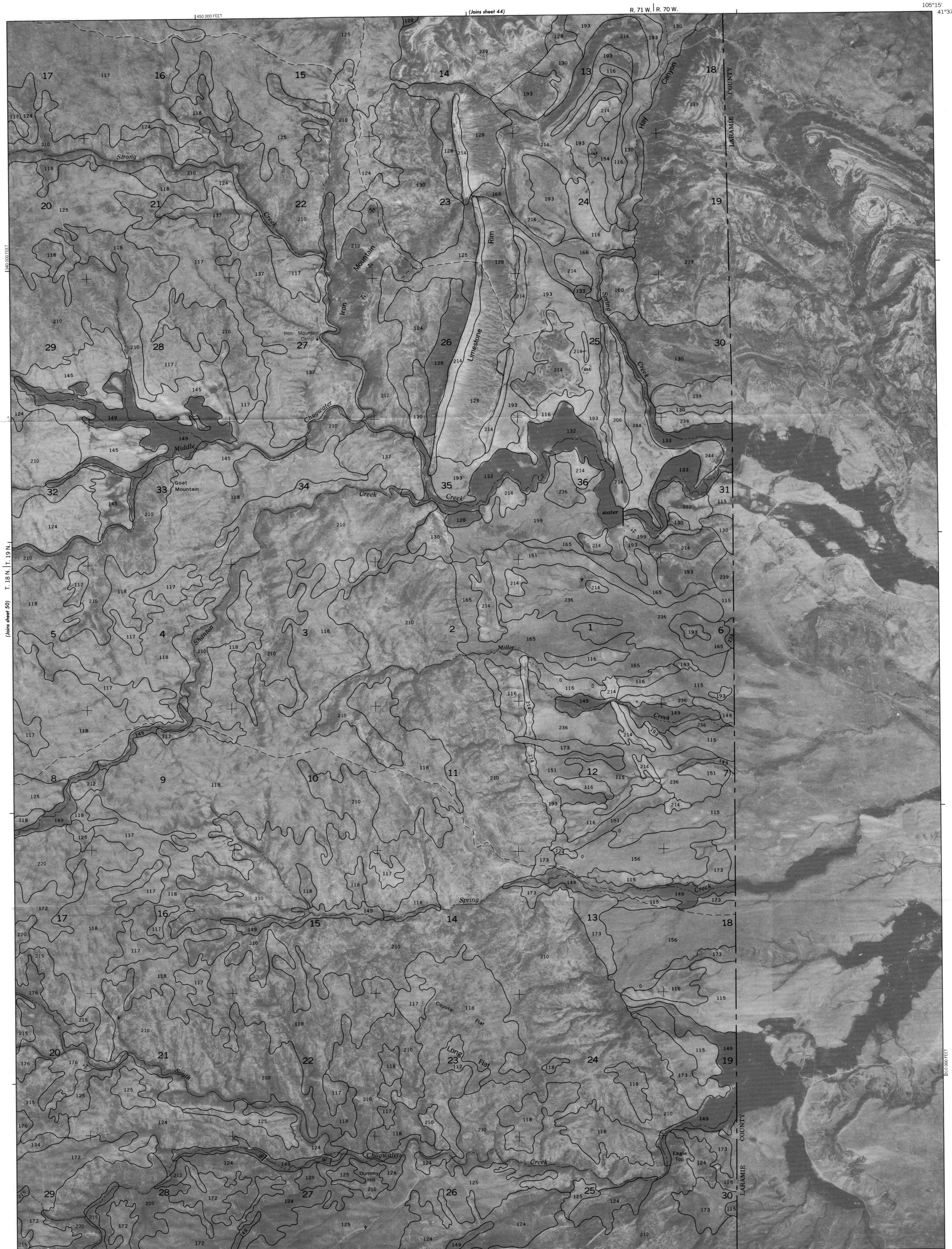


This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

ALBANY COUNTY, WYOMING NO. 50

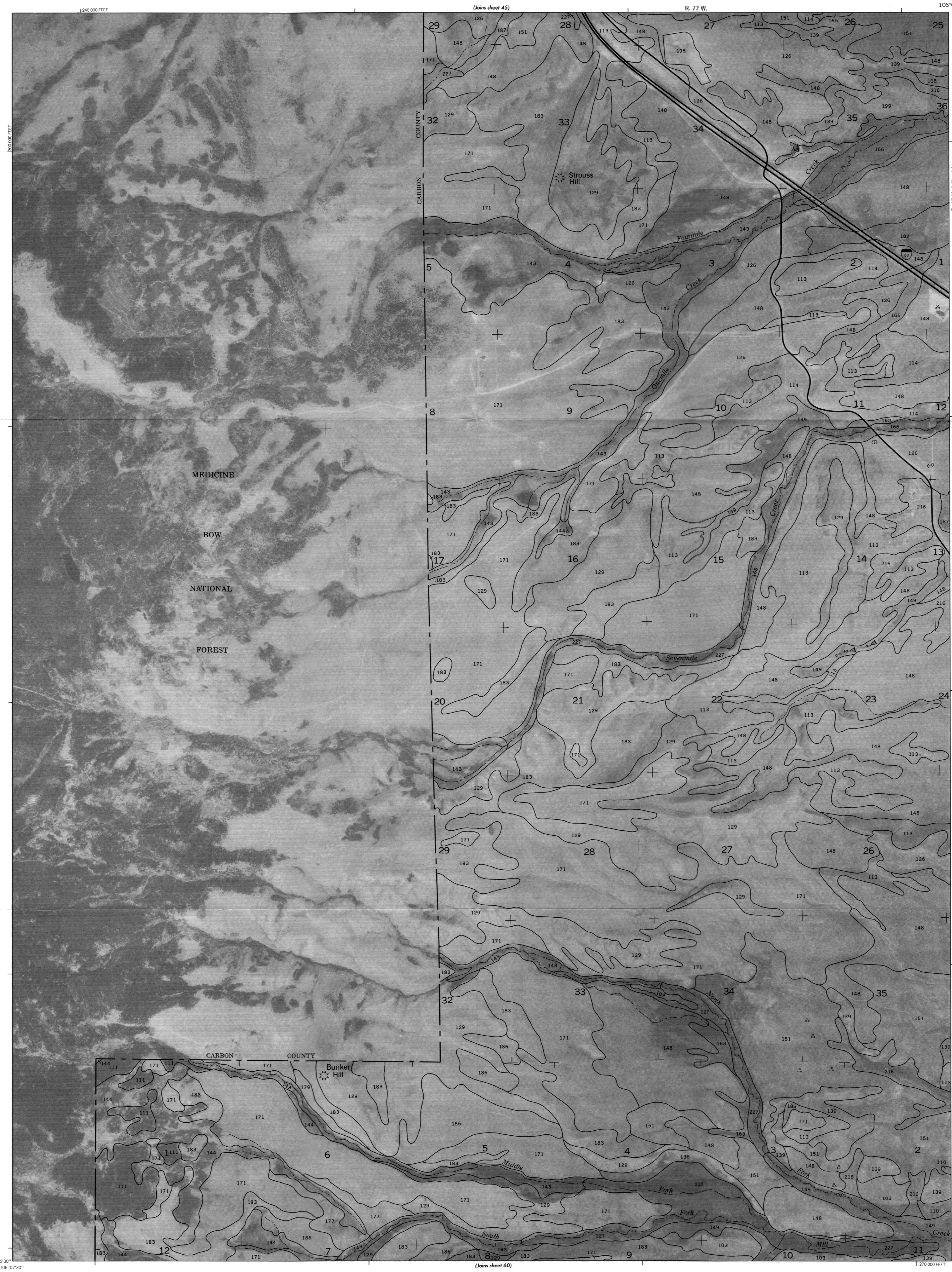
N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

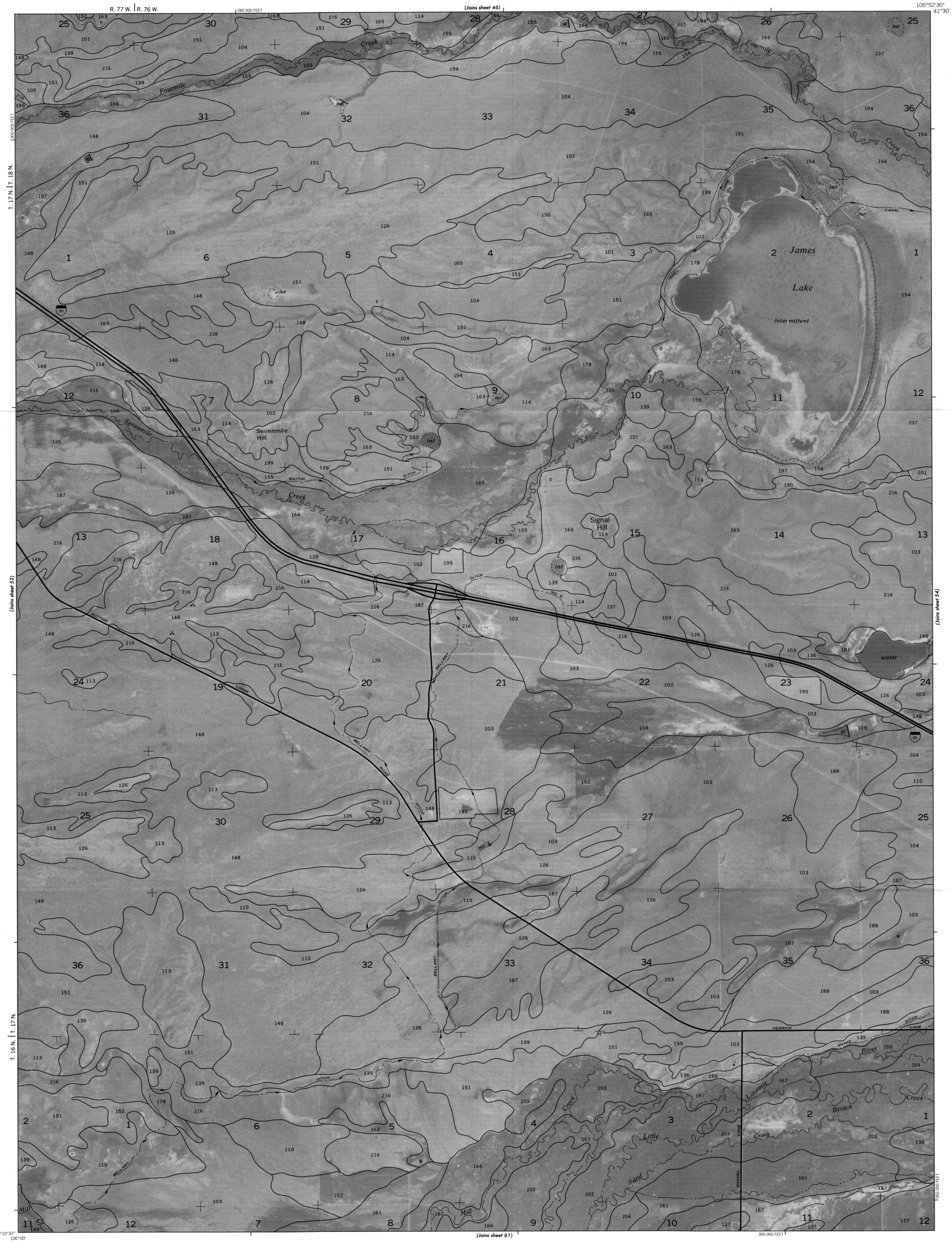
N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

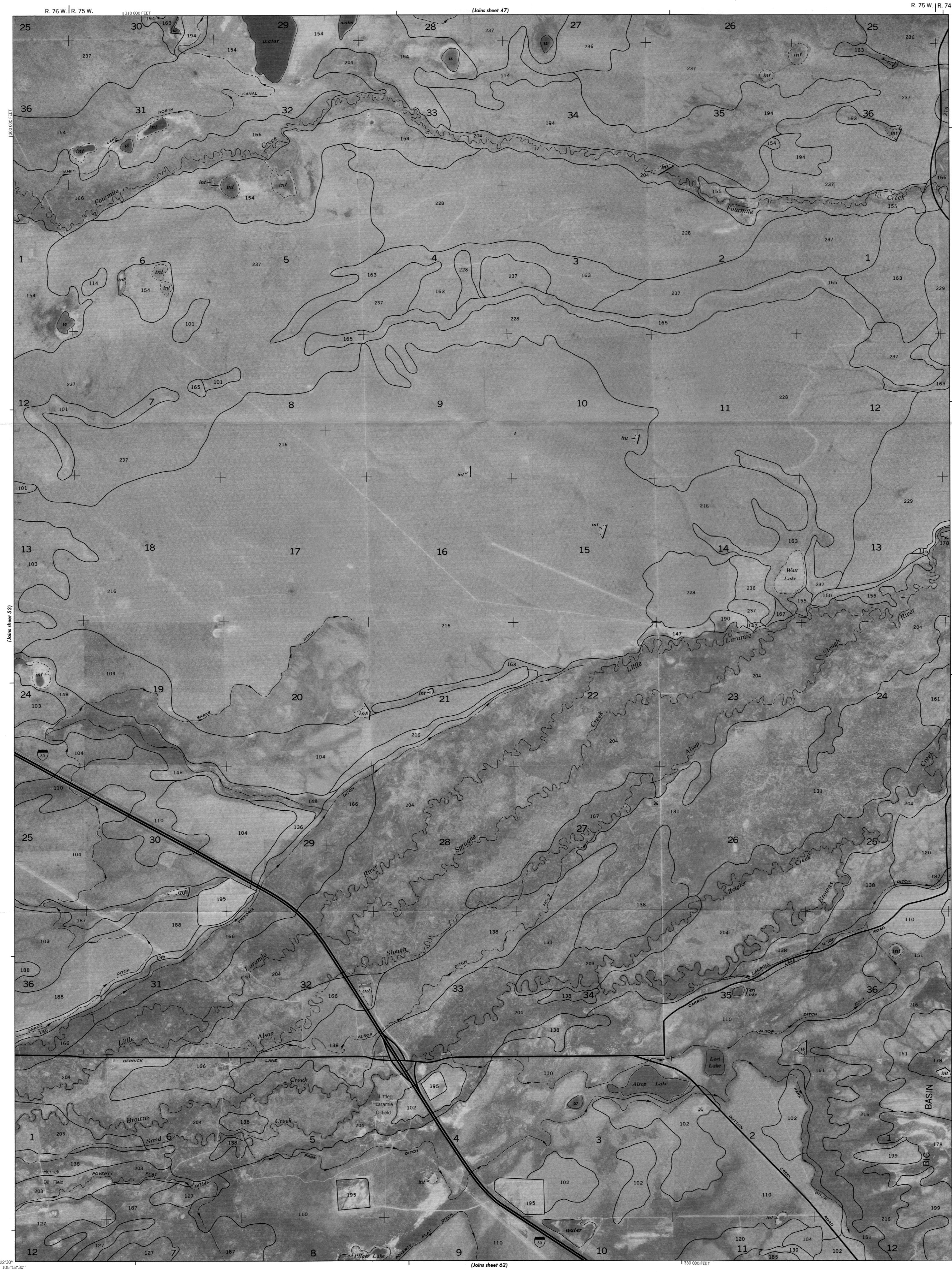
SCALE 1:24 000

1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

N

105°45'
R. 76 W. | R. 75 W.
R. 75 W. | R. 74 W.
41°30'

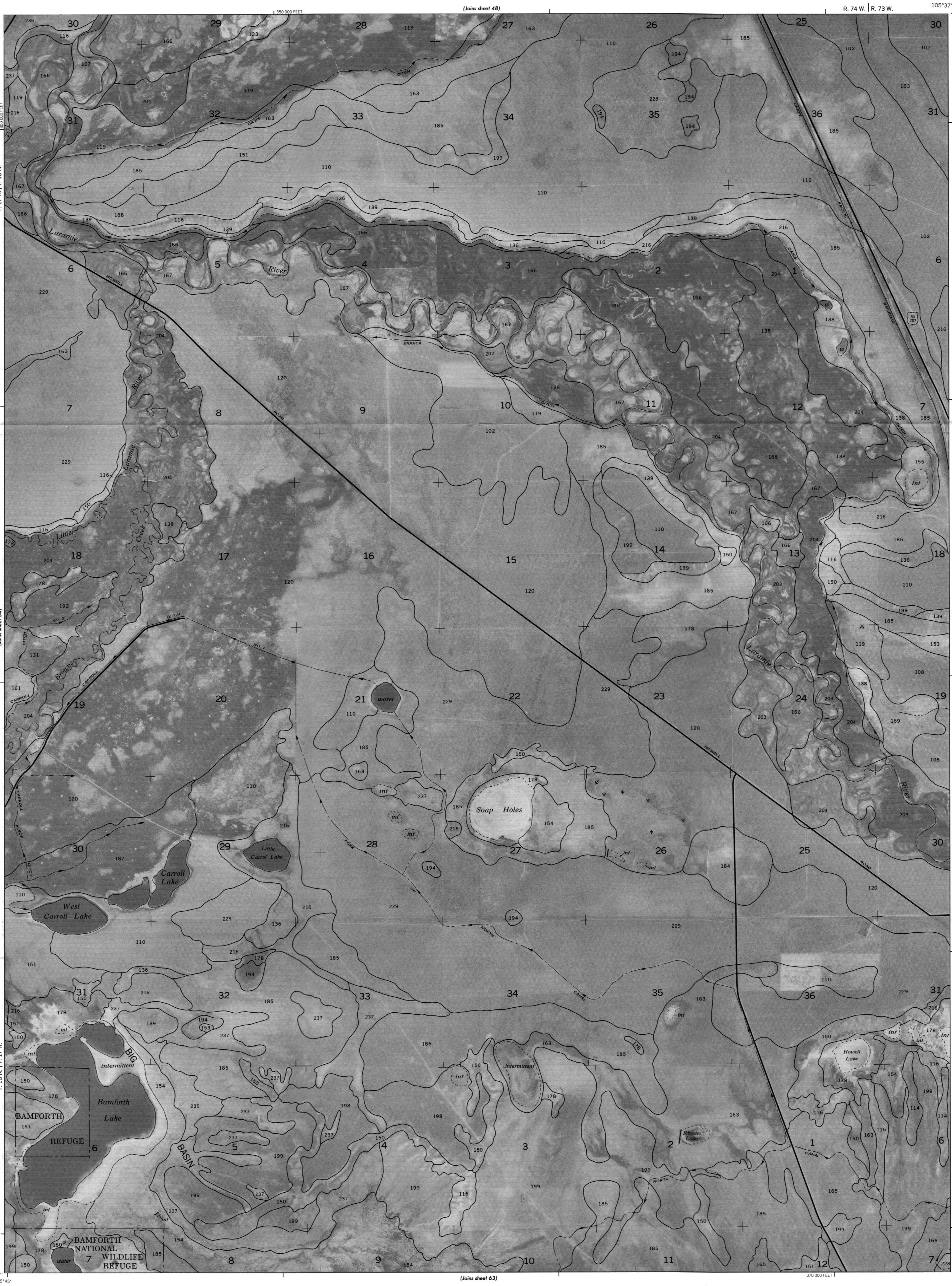


41°22'30"
105°52'30"

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

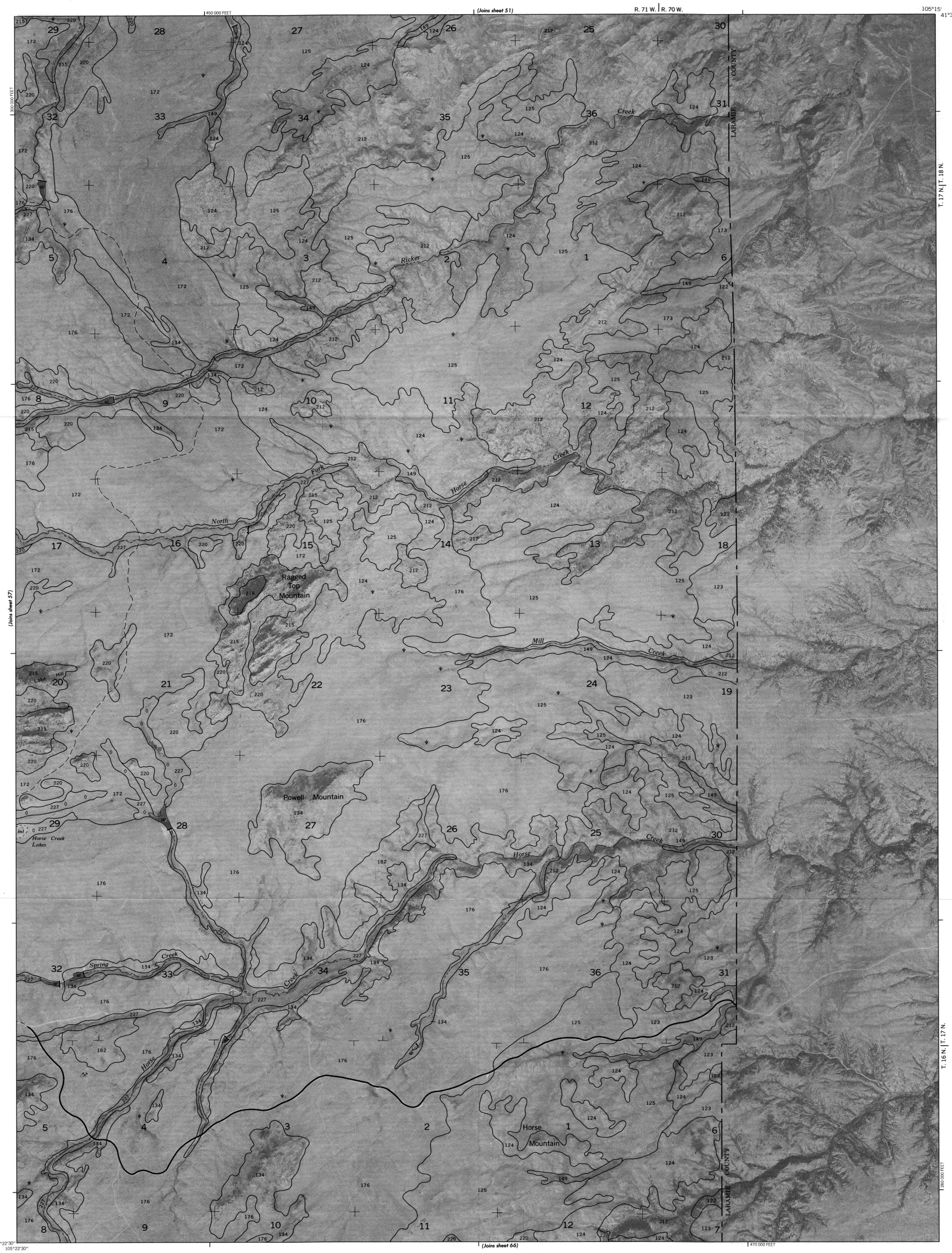
ALBANY COUNTY, WYOMING NO. 56

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 57

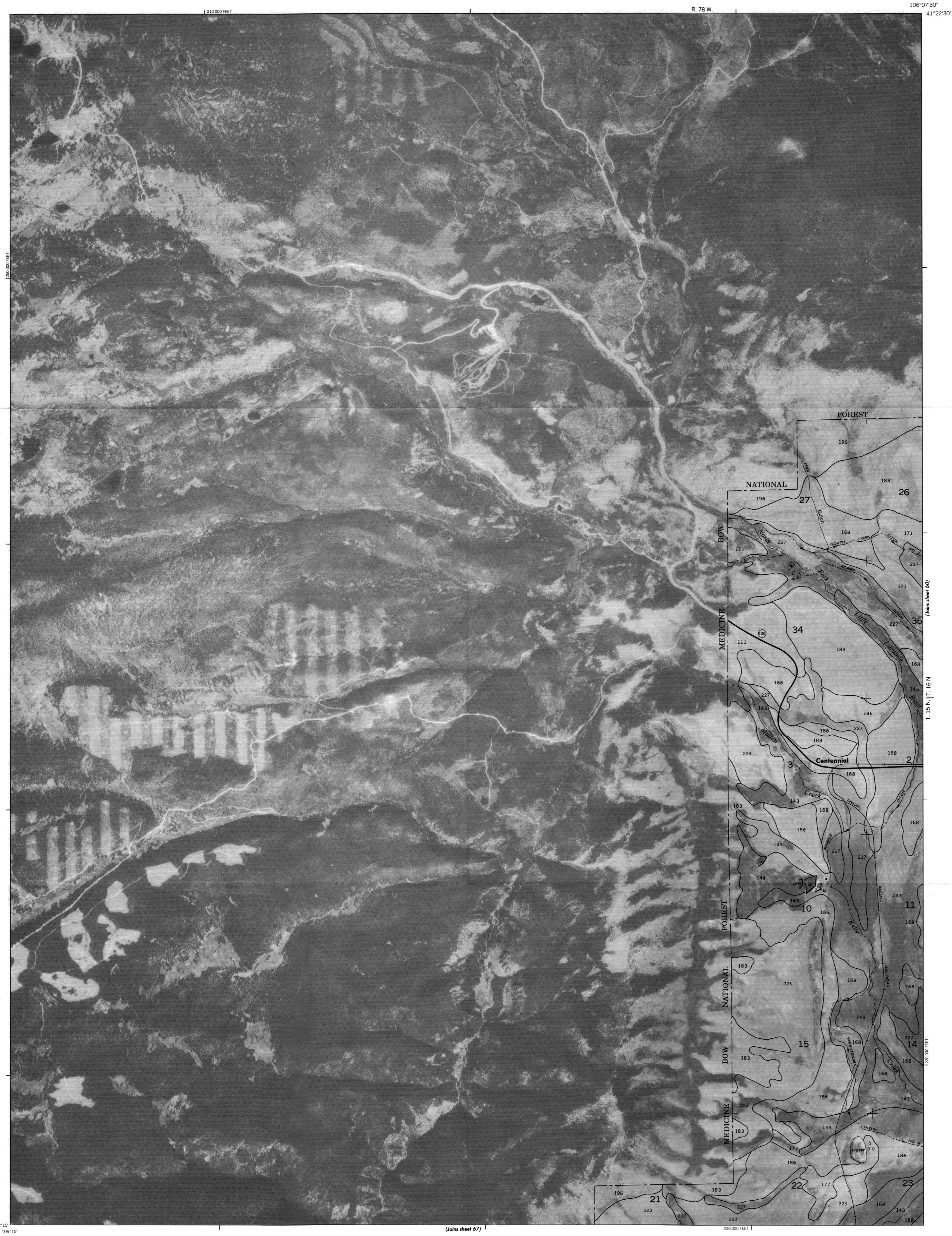


This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

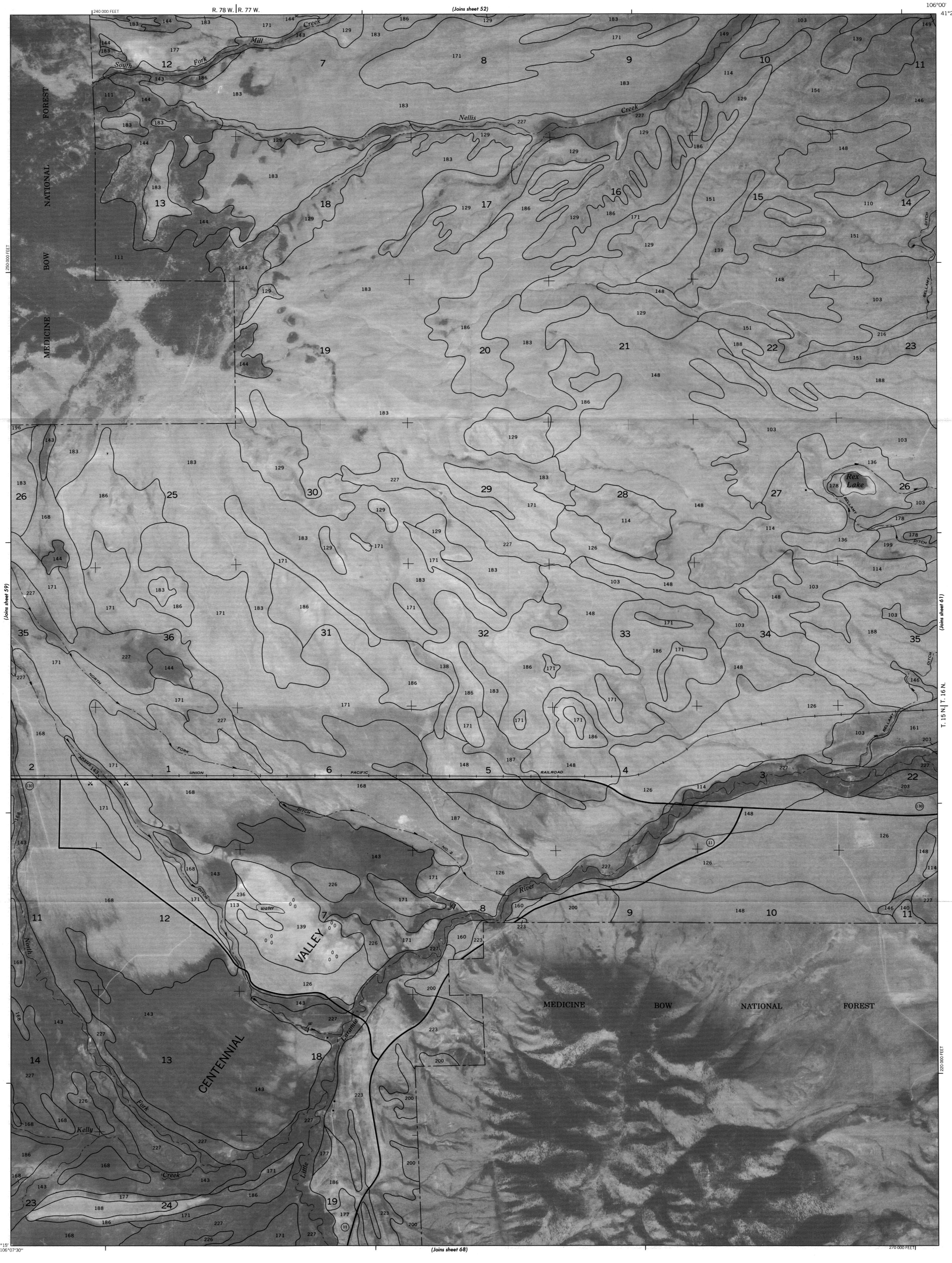
ALBANY COUNTY, WYOMING NO. 58



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

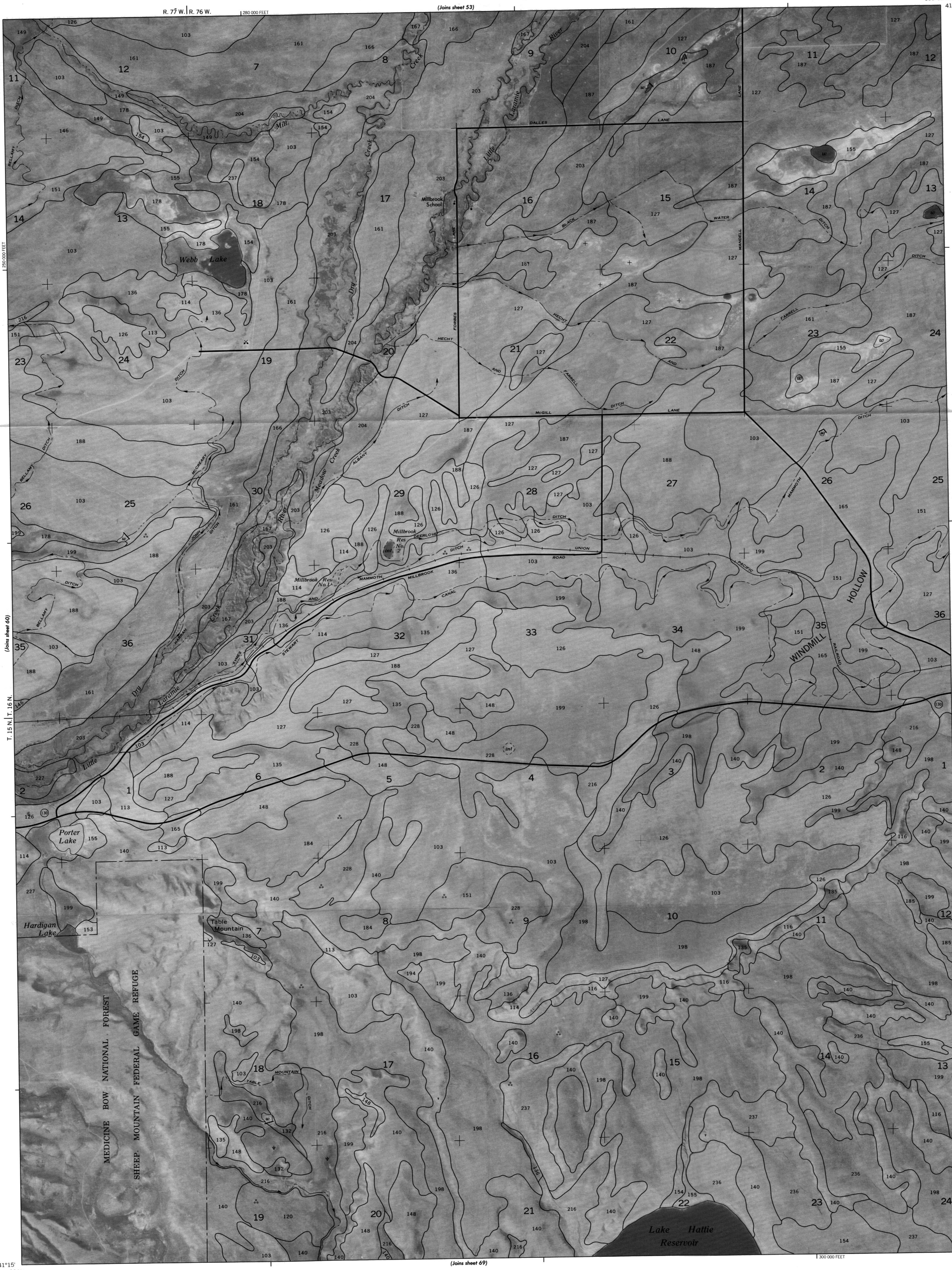
N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000

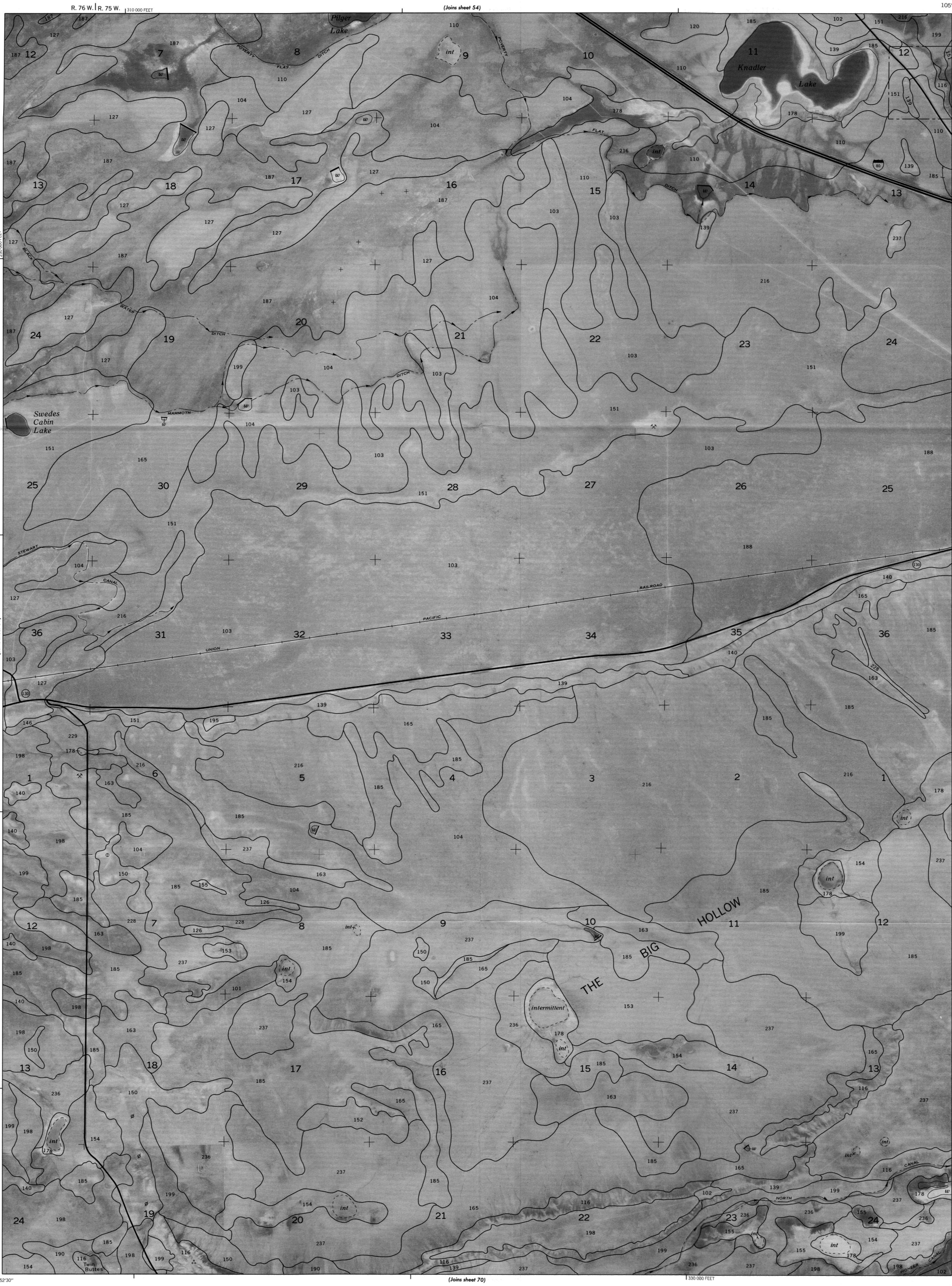
ALBANY COUNTY, WYOMING NO. 60



1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 62

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

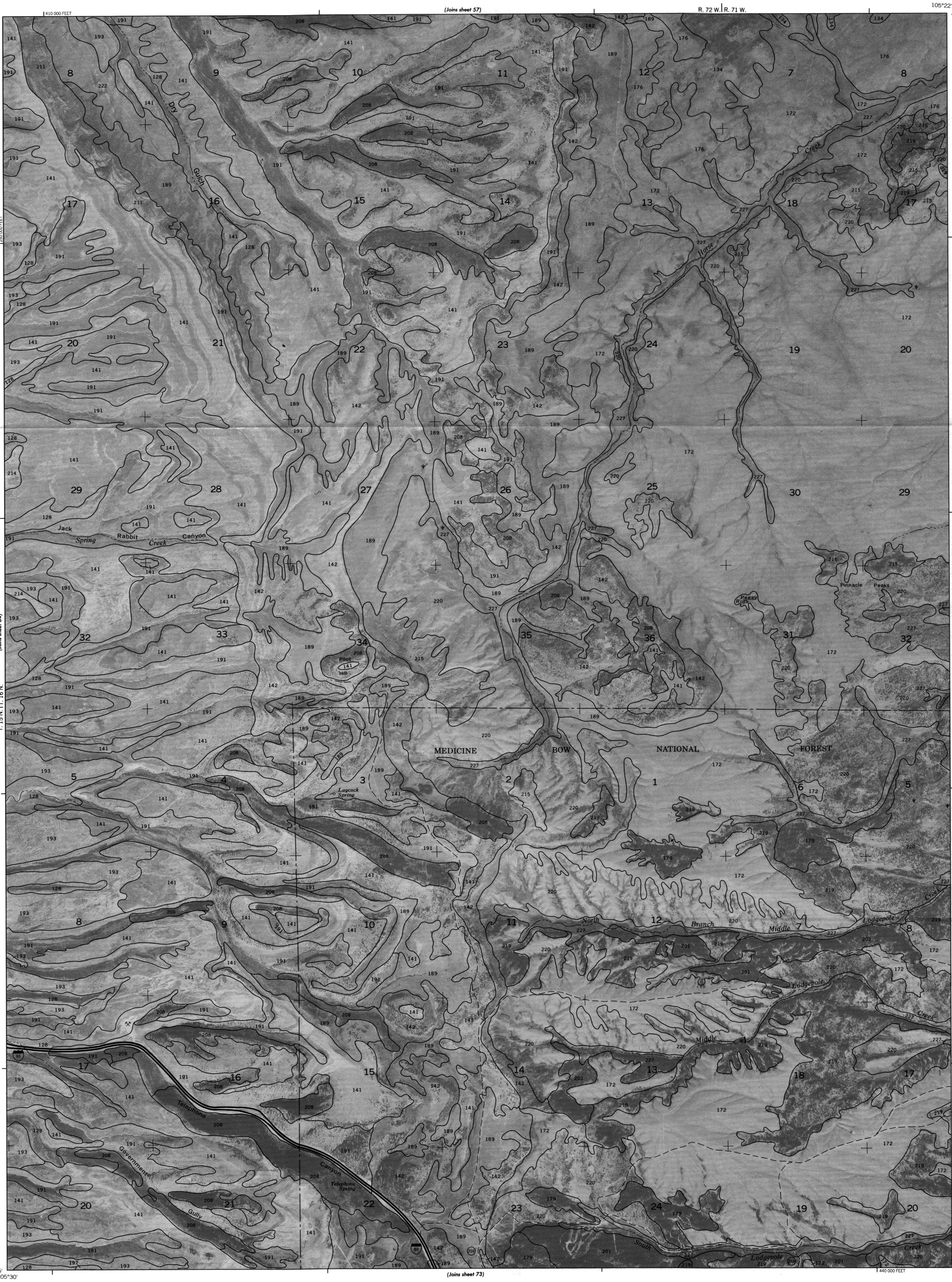
ALBANY COUNTY, WYOMING NO. 63

	1	3/4	1/2	1/4	0	1	2 MILES
	1	0.5	0	1	2 KILOMETERS		

SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

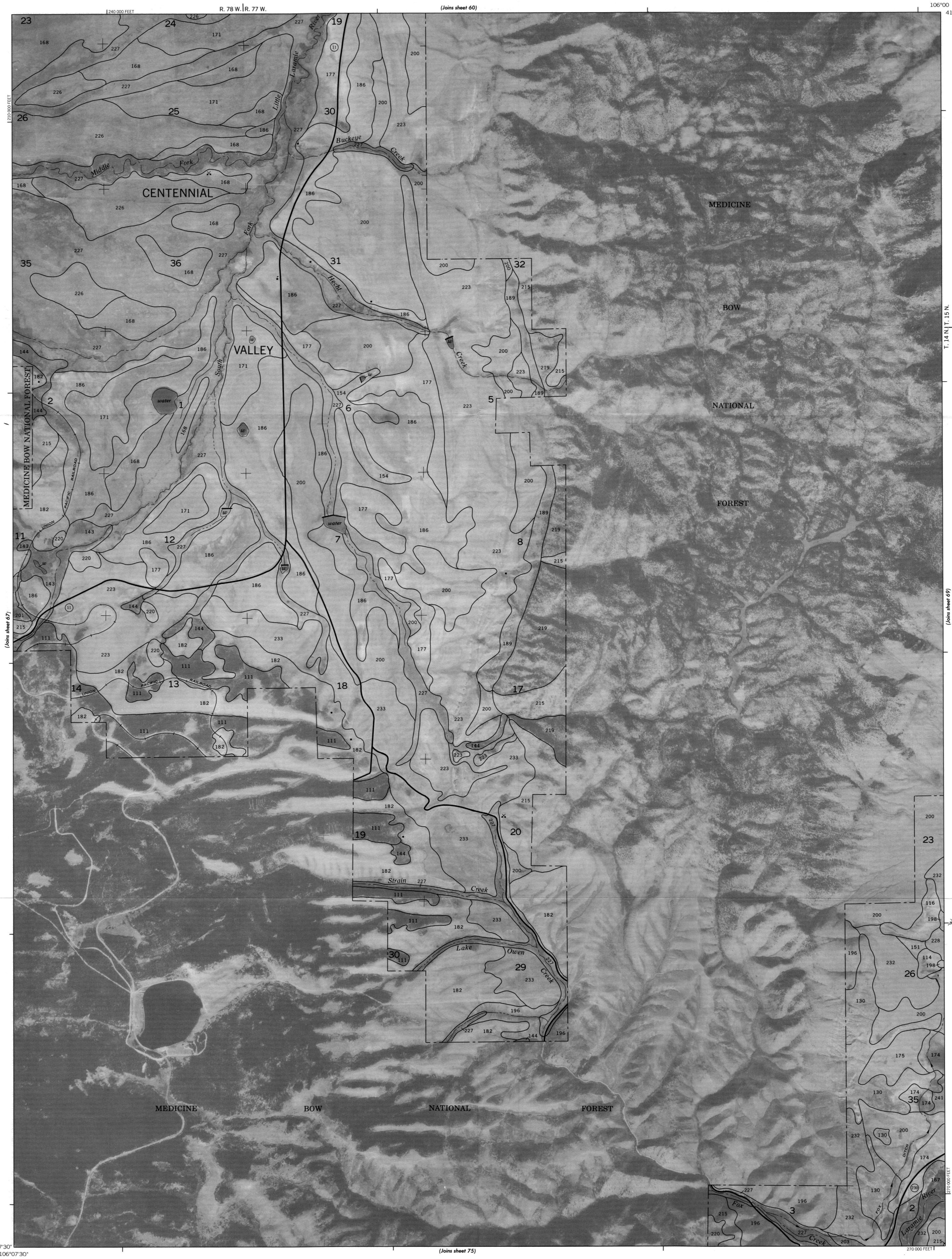
SCALE 1:24 000

ALBANY COUNTY, WYOMING NO. 66

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:24 000
1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS

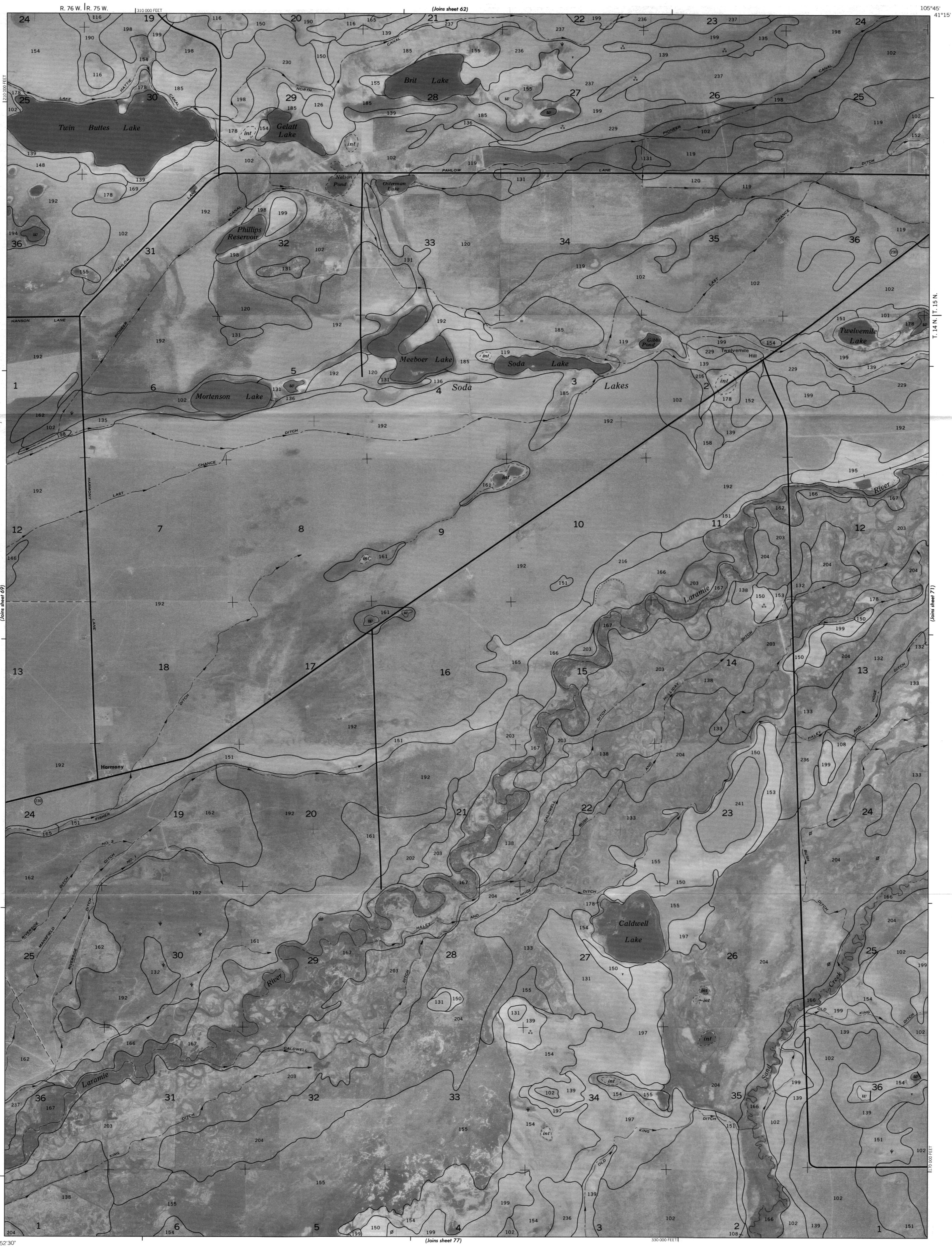
N

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N



1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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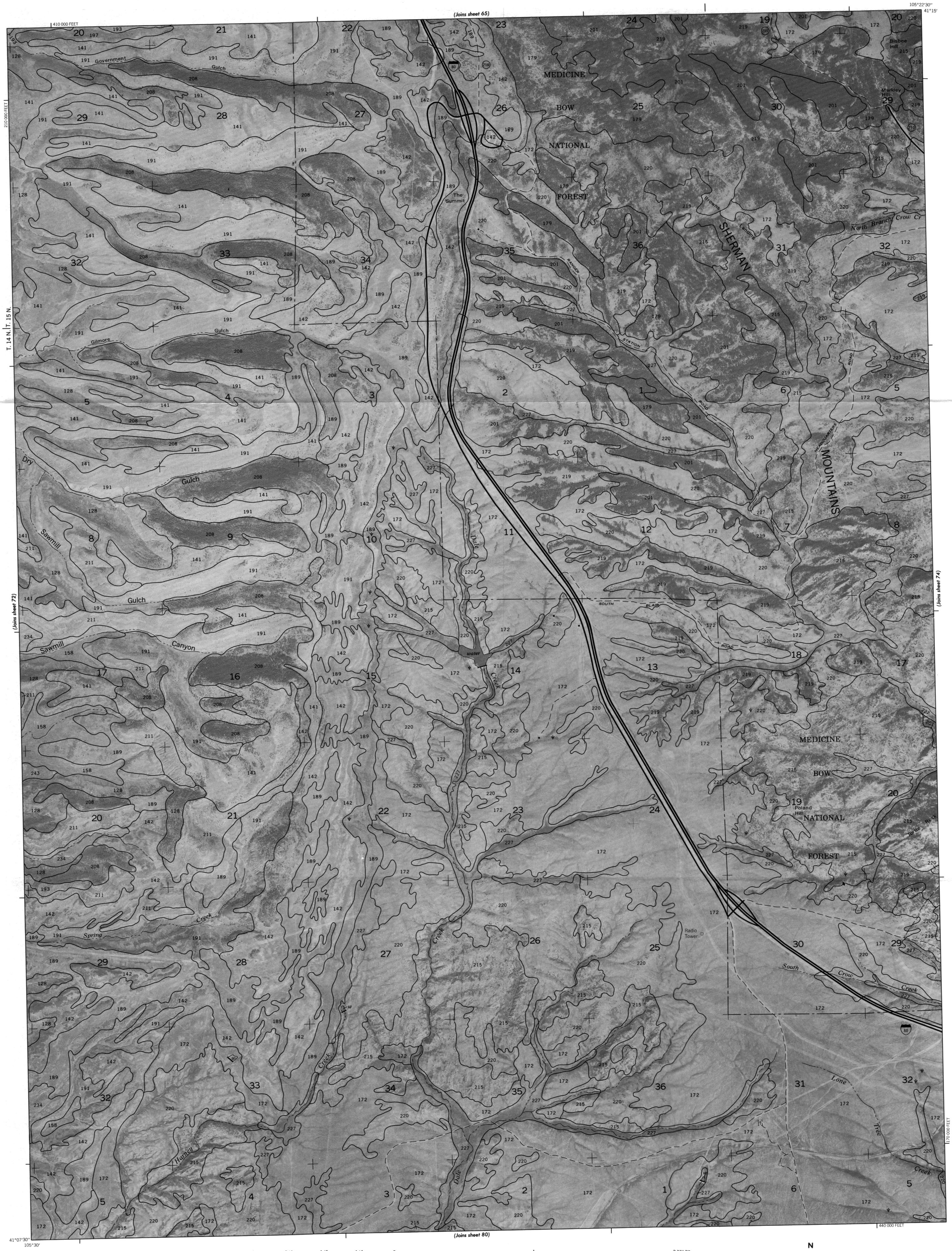
1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

ALBANY COUNTY, WYOMING NO. 72



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

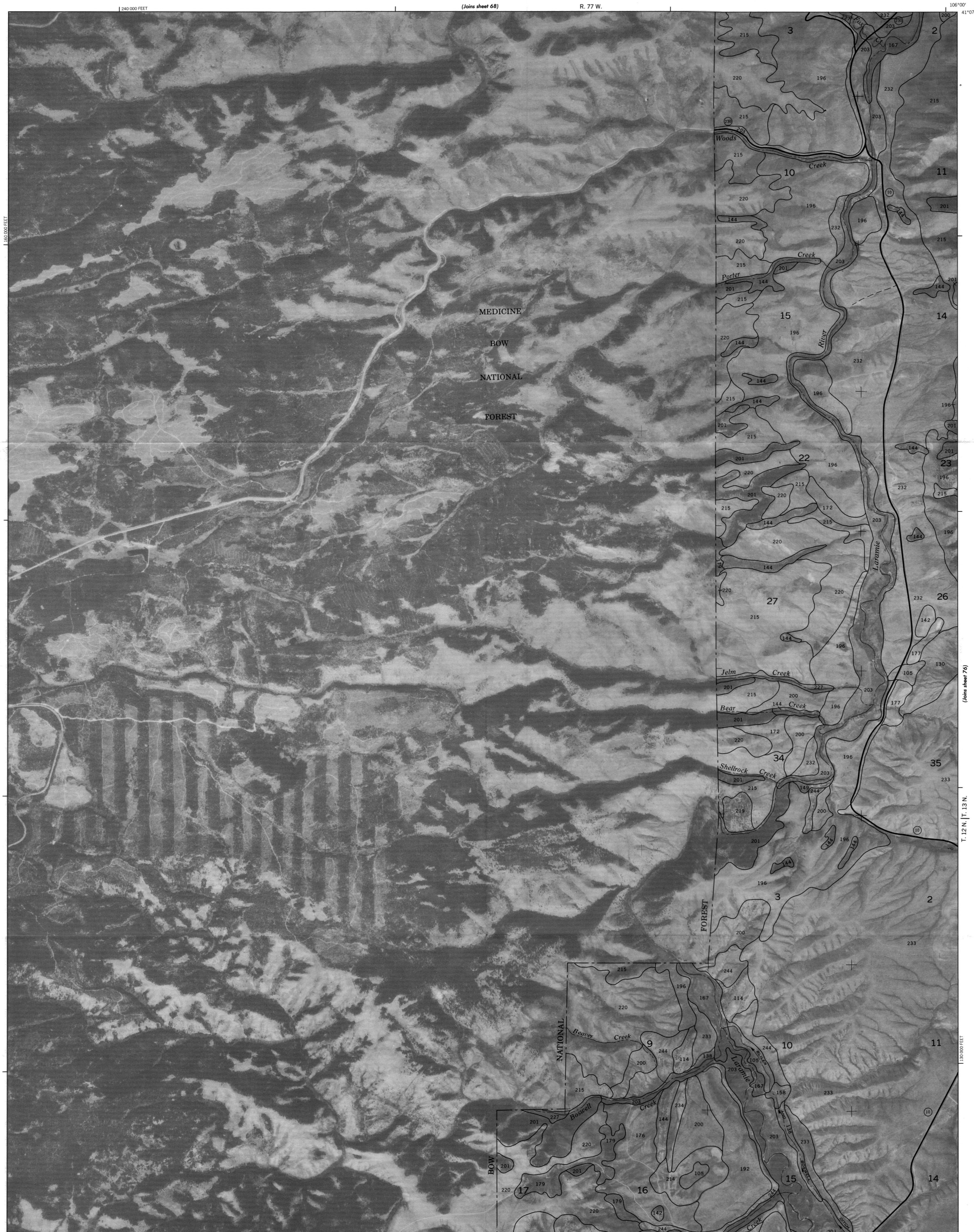
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

1	3/4	1/2	1/4	0		1		2 MILES
1		0.5		0		1		2 KILOMETERS

SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



SCALE 1:24 000

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1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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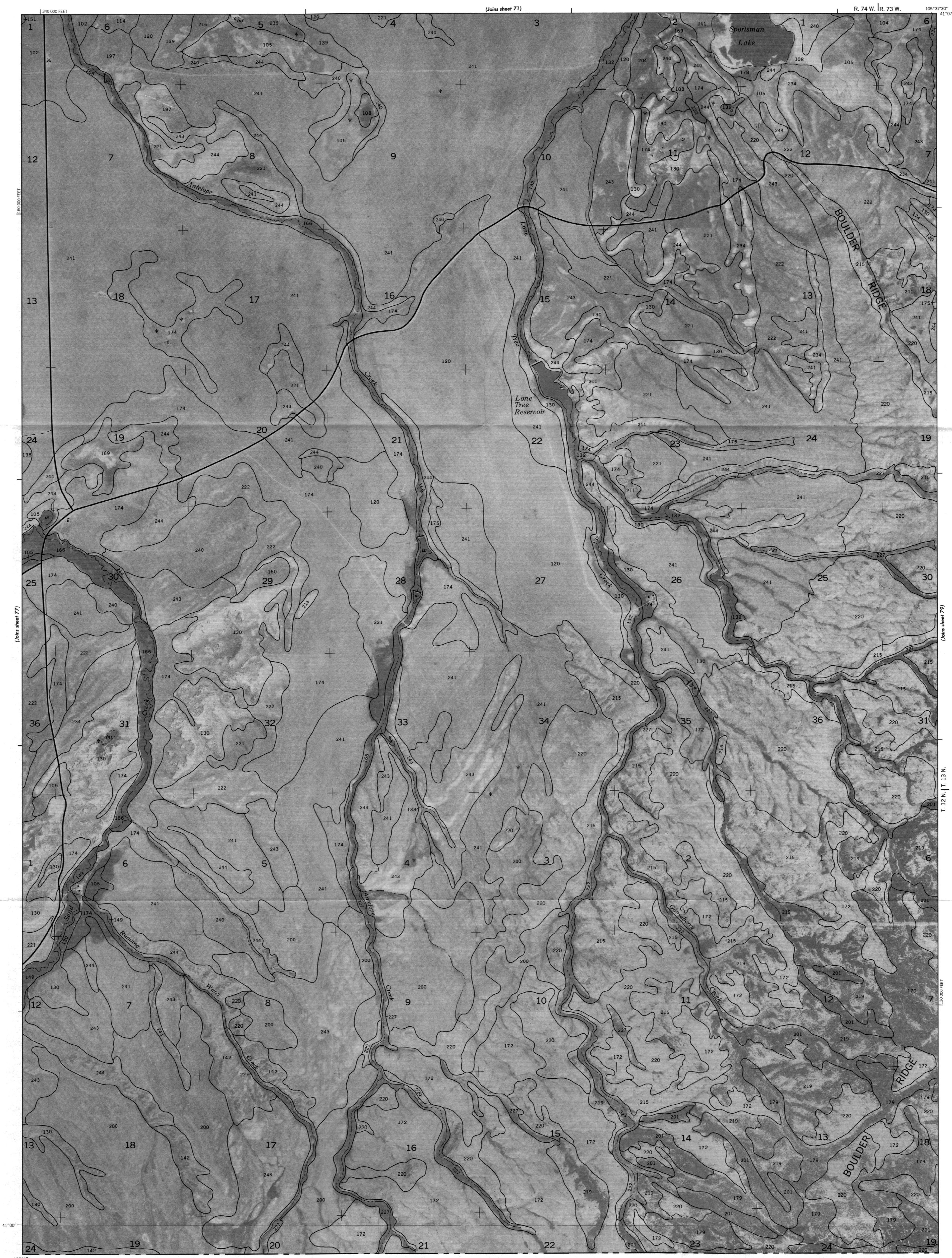
1 3/4 1/2 1/4 0 1 2 MILES

1 0.5 0 1 2 KILOMETERS

SCALE 1:24 000

N

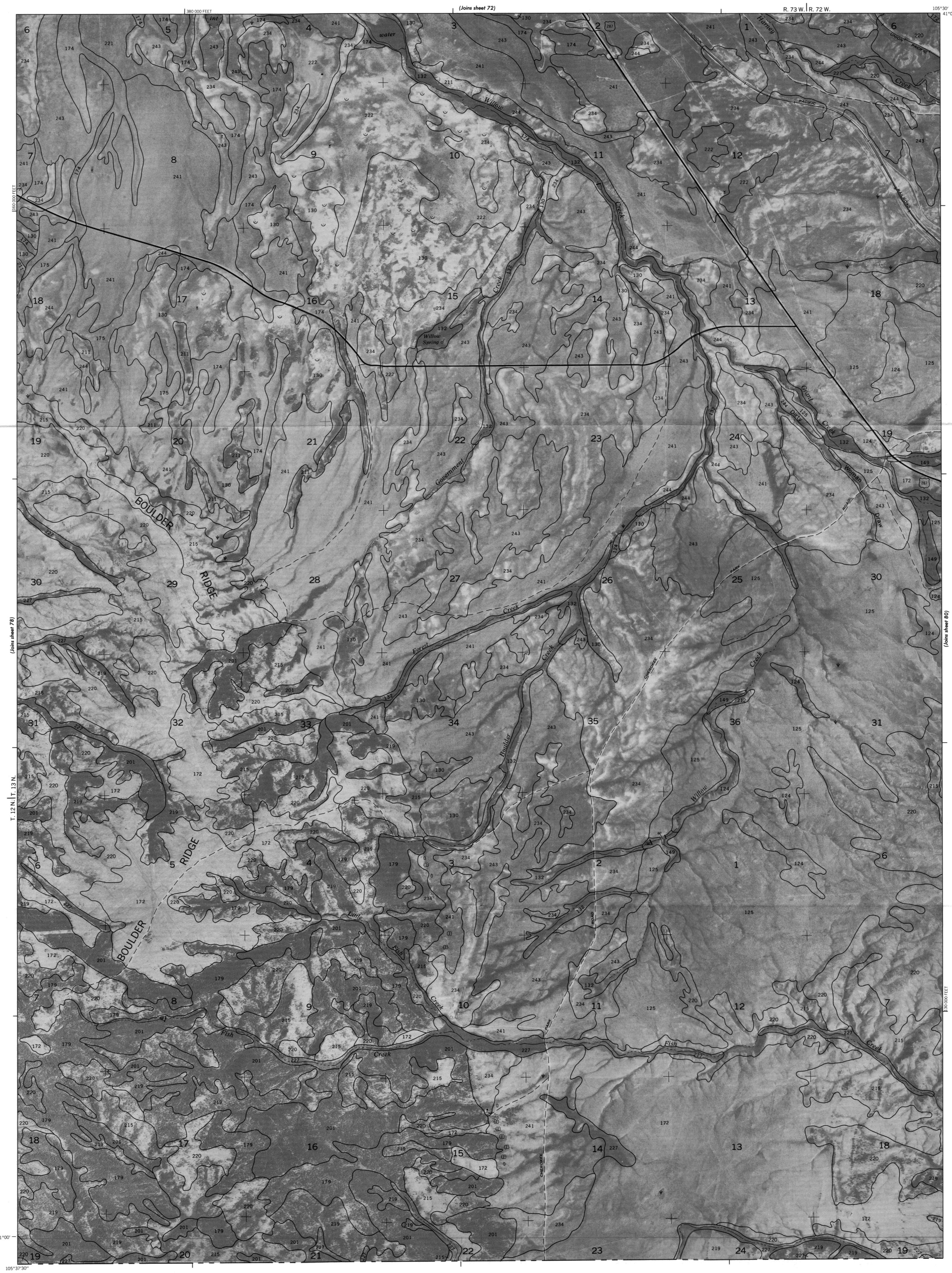


1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

ALBANY COUNTY, WYOMING NO. 78

N



1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

ALBANY COUNTY, WYOMING NO. 79

3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

1 3/4 1/2 1/4 0 1 2 MILES
1 0.5 0 1 2 KILOMETERS
SCALE 1:24 000

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of the Interior, Geological Survey, from 1976 - 1981 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.